Relative Error
BARC India

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Table of Contents

Relative Error: Foreword

There is a tendency to look at granular audience target groups to understand ratings. Ideally, this approach of targeting a focused audience may seem attractive, but it has its caveats. The term Relative Error (RE) is simply the expected deviation that could be encountered in any statistical sample.

As RE is primarily driven by the sample size of any Panel, the confidence level used, and the size of the audience estimate itself, can fluctuate sporadically. The RE for a Hindi GEC would be lower than that of an English News channel. The audience base for a Hindi GEC would always be higher, leading to meaningful insights even at granular cuts. On the other hand, for an English News channel, the same would not hold.

Looking at a wider target group over a longer period, would yield better insights. For a channel with a low audience base, the point estimate observed for an extremely granular cut, may not give a precise understanding of the performance of the channel. Nonetheless, any topical event shows a discernable movement in the audience which can be utilised to derive meaningful insights. For example, during events like Exit Polls, where the News channels are sampled to a greater extent, it is possible to have a finer demographic cut with a lower RE as compared to a regular news day. Similarly, channels belonging to genres like sports with live telecasts, or movies with blockbuster airings, would show higher consumption among audiences.

At BARC India, we recommend looking at estimates that fall under an acceptable limit of RE – the estimate should not be a one-off event derived from a granular cut of demographic which cannot be reproduced.

Sampling and Data Collection

It is impossible to collect TV viewing data at a census level. Therefore, BARC employs a sample-based approach where viewership is collected from a representative panel (i.e., sample) of individuals residing in TV-owning households. The sample is rigorously selected to minimize sampling and non-sampling errors, with a buffer sample over and above the design to reduce the impact of errors further. More details on BARC's sampling approach can be found in the *Description of Methodology* available on the BARC website[1].

The collection of viewership data is an intensive process, wherein second by second information is polled from panel homes to BARC India servers via BAR-O-Meters placed in the panel homes.

The precision and accuracy of audience estimates derived from the TV panel carry significant importance as it is used across the television advertising ecosystem.

[1] https://barcindia.co.in/measurement/television-audience-measurement-description-of-methodology.pdf

Relative Error

The audience estimates published by BARC are based on a panel of sampled households (i.e., a sample) which is then projected to the entire TV-owning universe. **Though BARC publishes audience estimates as point estimates, they are interval/range estimates. The range depends on the RE associated with each estimate.** BARC does provide Margins of Error (ME) in the YUMI reporting software which can be used to understand the RE of any audience estimate.

Relative Error (RE) is invoked to understand how precise an audience estimate is, bearing in mind this point estimate may have an expected degree of statistical variation. As such, the performance of any channel should not be judged on the point estimate alone, but rather as a trend over time. Users may often overlook that there could be a high underlying RE for some audience estimates.

It is, therefore, necessary to understand the associated RE with any point estimate, which is present in audience estimates.

Factors Affecting Relative Error

BARC measures over 580+ watermarked channels, where each channel can be categorized into a genre and a language. This mixture is coupled with the viewing preferences of individuals, which is dynamic and heterogeneous. Channels within genres strive to appeal to their target audience, and some may even carry multiple audio feeds to reach a larger audience base.

BARC is transparent in terms of publishing audience estimates as per the viewing panel and BARC's Data Validation processes[2]. Discrepancies and aberrations observed are thus often incidences of actual changes in viewing. These incidences are human behaviour which we know is idiosyncratic at times. Unexpected and unpredictable patterns emerging from a single point in time can be attributed to the very tenet of human behaviour which could never follow the same trend.

Let us take a program which has an estimated Average Daily Reach of 15% and assume that the RE associated with that program is 10% at a 90% confidence level. This can be loosely interpreted to mean that there is a 90% chance that the actual audience estimate will lie between 15% +/- (15% x 10%), which is the range of 13.5% to 16.5%.

Under Simple Random Sampling (SRS), we can calculate an RE using Equation 1.

$$Relative\ Error = z \times \frac{\sqrt{\frac{p \times q}{n}}}{p}$$

Equation 1 – Relative Error under Simple Random Sampling.

[2] https://barcindia.co.in/whitepaper/data-processing-and-validation-processes.pdf

where:
z = 1.64 for a 90% confidence interval
p = % of the sample that viewed the event (i.e., Reach% or Rat%)
q = % of the sample that did not view the event (i.e., 1 – p)
n = total sample of the Target Group (TG)

In reality, BARC uses a complex multi-stage probability-based sampling methodology for selecting households for the panel. Therefore, the calculation for RE is far more complicated. End users are, therefore, recommended to use the Margin of Error (ME) provided in YUMI, to understand the RE of an event (Equation 2).

$$Relative\ Error = \frac{ME}{p}$$

Equation 2. Relative Error using YUMI reported Margin of Error.

Factors Impacting Relative Error

Two primary factors affect the relative error:

1. The sample size of the TG (i.e., n)
2. The size of the audience estimate itself (i.e., p)

We can see from the RE formula (Equation 1 above) that the RE and Sample Size are inversely proportionate to each other. That is to say that if the sample size of the TG goes down, the RE levels will go up, and vice versa.

Example 1. Programs with different Reach but the same sample size.

Consider two programs of the same TG with a Reach of 10% for Program-1 and 1% for Program-2. The sample size is the same for each program as we are looking at the same TG. In this example, let's assume the sample size to be 5,000 individuals.

Due to the size of the audience estimate, the RE for Program-1 (Equation 3) will be lower than that of Program-2 (Equation 4) since its audience estimate is much larger (i.e., 0.0696% vs 0.2308%).

$$Relative\ Error\ Program - 1 = 1.64 \times \frac{\sqrt{\frac{10\% \times 90\%}{5000}}}{10\%} = 1.64 \times \frac{0.424\%}{10\%} = 0.0696\%$$

Equation 3. Relative Error of Program 1 for Example 1.

$$Relative\ Error\ Program - 2 = 1.64 \times \frac{\sqrt{\frac{1\% \times 99\%}{5000}}}{1\%} = 1.64 \times \frac{0.141\%}{1\%} = 0.2308\%$$

Equation 4. Relative Error of Program 2 for Example 1.

Example 2. Programs with the same Reach but different sample sizes.

Now, consider two programs with the same Reach% (e.g., 5%) in two different TGs. Let's assume that TG-1 has a sample which is much higher than that of TG-2 (e.g., 5,000 and 1,000 respectively). The RE associated with Program-1 (Equation 5) will be lower than that of

Program-2 (Equation 6) as the sample for Program-1 is higher than that of Program-2 (i.e., 0.1011% vs 0.2261%).

$$Relative\ Error\ Program-1 = 1.64 \times \frac{\sqrt{\frac{5\% \times 95\%}{5000}}}{5\%} = 1.64 \times \frac{0.424\%}{5\%} = 0.1011\%$$

Equation 5. Relative Error of Program 1 for Example 2.

$$Relative\ Error\ Program-2 = 1.64 \times \frac{\sqrt{\frac{5\% \times 95\%}{1000}}}{5\%} = 1.64 \times \frac{0.141\%}{5\%} = 0.2261\%$$

Equation 6. Relative Error of Program 2 for Example 2.

Why is Relative Error Important?

Consider a Hindi GEC with a Reach% of 10% at an All-India level – averaged across 28 days – that has a RE of 1.1% (Figure 1). However, the more granular the demographic cut, the larger the RE. As observed below, the RE for UP/UTK for the channel is at 3.8%. Proceeding with smaller cuts, the RE can increase to even 45.1%.

Relative Errors of a Hindi GEC Channel

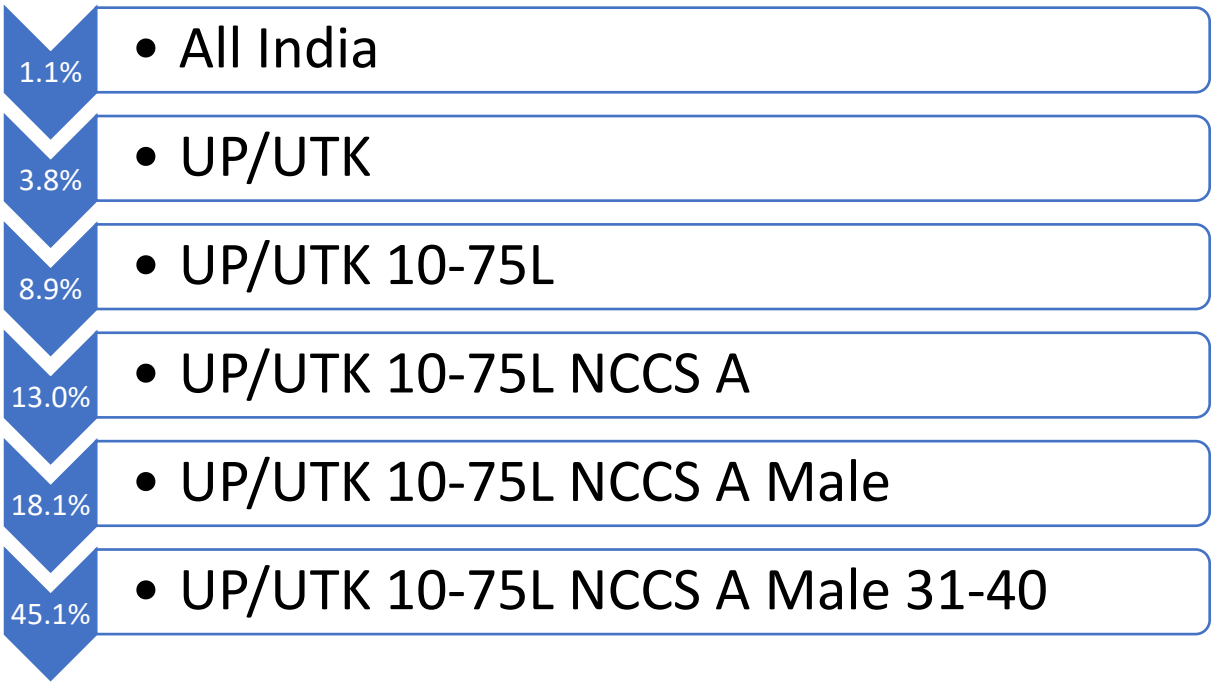

Figure 1. Relative Error of a Hindi GEC Channel.

To exemplify the variance in RE – another example is that of an English News channel with a Reach% of 0.6% at an All-India level – averaged across 28 days – that has a RE of 4.9% (Figure 2).

However, once again, the more granular the TG, the larger the RE. As observed below, the RE for UP/UTK for the channel is at 16.4%. Proceeding with smaller cuts, the RE can increase to even 193.5%.

Relative Errors of an English News Channel

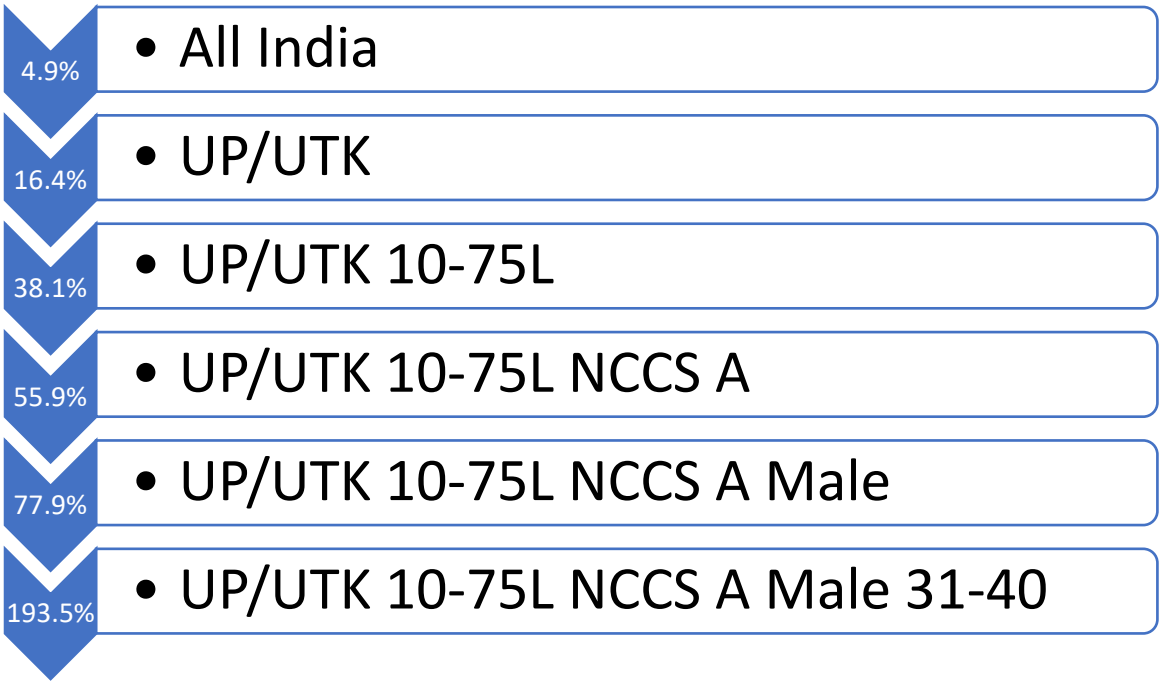

Figure 2. Relative Error of an English News Channel.

Relative Error for a 22K, 33K, 44K and 55K Household Panel

Figure 3 illustrates indicative REs for Total TV with an Average Daily Reach of 62.5% and an average household size of 4.1 for various panel sizes.

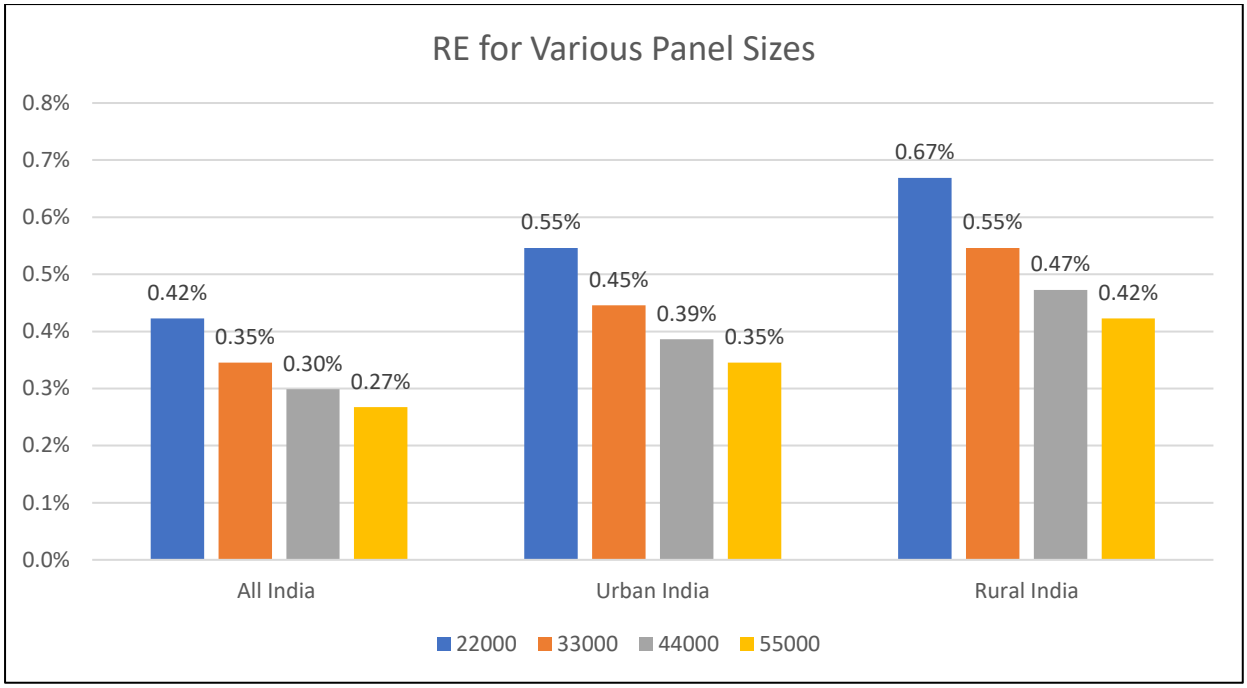

Figure 3. Relative Errors for increasing panel sizes.

Increasing the panel from 22K households to 55K households has decreased the RE by 36.8%. However, it should be noted that the decrease in RE is not linear to the increase in the panel sample size. It requires four times the sample to halve the RE.

Changes in RE by Genre, State Group and Town Class

The RE associated with the genres, gives an indication of the expected variance (Table 1). Genres can show a dramatic shift in the REs in case of topical events being telecasted.

Table 1. Relative Error Levels for Genres Across Town Classes.

Channel	Universe	Metros	10-75L	Below 75L U2	Below 10 L U2	Urban	Rural
TOTAL	0.4%	0.8%	1.0%	0.5%	0.6%	0.4%	0.6%
Movies	0.7%	1.3%	1.5%	0.8%	0.9%	0.7%	1.0%
News	0.6%	1.2%	1.4%	0.8%	0.9%	0.7%	0.9%
ENGLISH-Movies	7.7%	11.7%	12.5%	7.1%	8.5%	6.1%	14.4%
ENGLISH-News	3.4%	5.9%	16.7%	7.3%	7.8%	4.8%	5.3%
GEC	0.5%	1.1%	1.4%	0.7%	0.8%	0.6%	0.7%
Music	1.4%	2.9%	3.1%	1.6%	1.8%	1.4%	1.9%
Kids	1.3%	2.3%	2.4%	1.3%	1.6%	1.1%	1.8%
Sports	1.7%	3.4%	4.3%	2.1%	2.3%	1.8%	2.5%
Infotainment	2.7%	5.5%	5.3%	3.3%	4.2%	2.9%	4.8%
EEC	11.4%	19.4%	14.8%	9.2%	11.4%	14.7%	17.0%

Low RE High RE

BARC 2+ Individuals – Wk07'18-Wk01'23 RE(rat%)

The RE at All-India level for Total TV is 0.4% (Table 2). At a single state group level, that varies from 0.9% to 3.4%. In each of the six metros, the RE further varies from 1.5% to 2.5%.

Table 2. Total TV Relative Error Levels for Genres Across State Group X Town Class.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	0.4%	0.8%	1.0%	0.5%	0.6%	0.4%	0.6%
HSM	0.6%	1.0%	1.0%	0.6%	0.7%	0.5%	0.9%
South	0.6%	1.3%	1.9%	0.9%	1.0%	0.7%	0.8%
Assam / North East / Sikkim	2.5%					2.8%	2.9%
Bihar/Jharkhand	3.4%					2.5%	3.9%
Delhi	1.5%	1.5%				1.5%	
Guj / D&D / DNH	1.6%		1.9%		2.3%	1.5%	2.5%
Har/HP/J&K	2.7%					2.7%	3.3%
Mah / Goa	1.1%	1.7%	2.3%		1.5%	1.0%	1.8%
MP/Chhattisgarh	2.3%		2.4%		2.1%	1.6%	3.0%
Odisha	2.0%					2.7%	2.2%
Pun/Cha	2.7%					2.6%	3.5%
Rajasthan	2.7%					2.3%	3.7%
UP/Uttarakhand	1.4%		2.3%		1.7%	1.4%	1.9%
West Bengal	1.1%	1.8%		1.8%		1.3%	1.6%
AP / Telangana	1.1%	2.2%		1.7%		1.4%	1.5%
Karnataka	1.0%	2.2%			2.0%	1.5%	1.4%
Kerala	1.8%		2.3%		3.9%	2.0%	2.7%
TN/Pondicherry	0.9%	2.5%		1.3%		1.2%	1.4%

BARC 2+ Individuals – Wk07'18-Wk01'23 RE(rat%): Non-reporting and sampled Non-cuts have been excluded

Summary

The decrease in Relative Error (RE) observed is due to continued panel expansions by BARC India and the corresponding increase in sample size. There are smaller genres which show a higher degree of RE due to the lower incidence of viewing. The increase in RE is substantial if we dissect and look at finer cuts in demographics – each cut increases the magnitude significantly. A demographic cut with RE, does not indicate a precise view of the performance of a channel, and as such, a longitudinal trend is a more useful measure and understanding of performance.

The audience sampling of a channel has a bearing on its RE. BARC has striven to increase its panel to have a more robust base. This expansion would in turn lead to a more precise understanding of a channel's viewership. Additionally, this also results in a higher probability of niche channels being sampled.

However, one must consider that the relationship between sample size and Relative Error is not linear, and thus, the relative utility of decreases in RE per additional sample, diminishes as the panel continues to expand.

End users of BARC's audience estimates are therefore encouraged to leverage the margin of error utility in YUMI and consider the RE of any audience estimate.

Appendix

Genre wise RE across State Group * Pop Strata for reference

Table 3. RE Levels Across State Group X Town Class in GEC Genre

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	0.5%	1.1%	1.4%	0.7%	0.8%	0.6%	0.7%
HSM	0.7%	1.3%	1.5%	0.8%	0.9%	0.7%	1.1%
South	0.7%	1.7%	2.4%	1.1%	1.2%	0.9%	1.0%
Assam / North East / Sikkim	3.2%					4.1%	3.8%
Bihar/Jharkhand	4.8%					3.7%	5.9%
Delhi	2.0%	2.0%				2.0%	
Guj / D&D / DNH	2.2%		2.6%		3.0%	2.0%	3.6%
Har/HP/J&K	3.8%					4.2%	4.6%
Mah / Goa	1.4%	2.1%	3.0%		2.0%	1.3%	2.3%
MP/Chhattisgarh	2.9%		3.6%		2.8%	2.2%	4.0%
Odisha	2.4%					3.3%	2.6%
Pun/Cha	3.5%					3.6%	4.5%
Rajasthan	3.1%					3.4%	4.3%
UP/Uttarakhand	1.9%		3.4%		2.4%	1.9%	2.6%
West Bengal	1.3%	2.4%		2.4%		1.7%	1.9%
AP / Telangana	1.3%	2.9%		2.1%		1.8%	1.8%
Karnataka	1.2%	2.8%			2.4%	1.9%	1.6%
Kerala	2.1%		2.8%		4.9%	2.5%	3.0%
TN/Pondicherry	1.2%	3.2%		1.7%		1.6%	1.7%

Table 4. RE Levels Across State Group X Town Class in Movie Genre

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	0.7%	1.3%	1.5%	0.8%	0.9%	0.7%	1.0%
HSM	1.0%	1.6%	1.6%	0.9%	1.1%	0.8%	1.3%
South	1.0%	2.3%	3.6%	1.6%	1.8%	1.3%	1.5%
Assam / North East / Sikkim	4.6%					4.2%	5.1%
Bihar/Jharkhand	4.7%					3.5%	5.3%
Delhi	2.5%	2.5%				2.5%	
Guj / D&D / DNH	2.6%		3.1%		3.6%	2.4%	3.9%
Har/HP/J&K	4.5%					4.2%	5.3%
Mah / Goa	1.9%	2.9%	3.4%		2.3%	1.6%	2.9%
MP/Chhattisgarh	3.4%		3.8%		3.2%	2.5%	4.2%
Odisha	3.7%					4.4%	4.5%
Pun/Cha	4.1%					3.8%	5.4%
Rajasthan	4.2%					3.5%	5.6%
UP/Uttarakhand	2.1%		3.6%		2.7%	2.2%	2.7%
West Bengal	2.0%	3.3%		3.1%		2.4%	3.1%
AP / Telangana	1.8%	3.7%		3.2%		2.4%	2.5%
Karnataka	1.8%	4.0%			3.4%	2.6%	2.4%
Kerala	3.1%		4.1%		6.4%	3.6%	4.7%
TN/Pondicherry	1.6%	4.3%		2.3%		2.1%	2.3%

Table 5. RE Levels Across State Group X Town Class in the News Genre

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	0.6%	1.2%	1.4%	0.8%	0.9%	0.7%	0.9%
HSM	0.7%	1.5%	1.6%	0.9%	1.2%	0.8%	1.2%
South	0.9%	1.9%	2.5%	1.3%	1.5%	1.1%	1.3%
Assam / North East / Sikkim	3.1%					4.8%	3.6%
Bihar/Jharkhand	3.6%					3.4%	4.7%
Delhi	2.4%	2.4%				2.4%	
Guj / D&D / DNH	2.2%		2.9%		3.1%	2.1%	3.9%
Har/HP/J&K	3.8%					6.9%	4.4%
Mah / Goa	1.3%	2.4%	3.1%		2.1%	1.5%	2.4%
MP/Chhattisgarh	2.6%		4.5%		3.3%	2.7%	4.3%
Odisha	2.9%					4.1%	3.6%
Pun/Cha	3.2%					3.4%	4.5%
Rajasthan	5.2%					4.1%	7.4%
UP/Uttarakhand	2.0%		3.8%		2.8%	2.3%	3.1%
West Bengal	1.8%	3.2%		3.2%		2.4%	2.8%
AP / Telangana	1.6%	3.0%		2.4%		1.9%	2.3%
Karnataka	1.5%	3.2%			2.8%	2.1%	2.2%
Kerala	2.2%		3.0%		5.2%	2.6%	3.3%
TN/Pondicherry	1.6%	4.1%		2.3%		2.1%	2.4%

Table 6. RE Levels Across State Group X Town Class in Music Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	1.4%	2.9%	3.1%	1.6%	1.8%	1.4%	1.9%
HSM	2.0%	3.3%	3.5%	1.8%	2.0%	1.6%	2.7%
South	1.8%	4.2%	6.1%	2.6%	2.8%	2.2%	2.5%
Assam / North East / Sikkim	7.6%					7.1%	8.2%
Bihar/Jharkhand	11.2%					6.4%	12.4%
Delhi	5.2%	5.2%				5.2%	
Guj / D&D / DNH	4.4%		7.3%		6.6%	5.1%	6.6%
Har/HP/J&K	8.7%					7.5%	9.9%
Mah / Goa	4.0%	5.7%	7.1%		4.2%	3.1%	6.0%
MP/Chhattisgarh	6.8%		7.0%		6.8%	4.9%	8.2%
Odisha	6.8%					8.6%	7.8%
Pun/Cha	8.7%					8.3%	10.2%
Rajasthan	10.9%					7.6%	13.3%
UP/Uttarakhand	3.8%		5.8%		4.7%	3.8%	5.1%
West Bengal	3.9%	7.0%		6.8%		5.1%	5.7%
AP / Telangana	3.1%	7.4%		4.8%		4.0%	4.2%
Karnataka	3.0%	6.5%			5.5%	4.3%	4.2%
Kerala	10.4%		11.0%		16.4%	9.2%	13.5%
TN/Pondicherry	2.6%	7.8%		3.5%		3.4%	3.8%

Table 7. RE Levels Across State Group X Town Class in Kids Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	1.3%	2.3%	2.4%	1.3%	1.6%	1.1%	1.8%
HSM	1.6%	2.4%	2.5%	1.4%	1.8%	1.2%	2.2%
South	1.9%	4.4%	6.3%	2.9%	3.3%	2.4%	2.8%
Assam / North East / Sikkim	5.5%					7.1%	6.1%
Bihar/Jharkhand	8.9%					6.4%	9.8%
Delhi	3.5%	3.5%				3.5%	
Guj / D&D / DNH	4.2%		4.7%		6.2%	3.9%	6.1%
Har/HP/J&K	6.2%					6.1%	6.9%
Mah / Goa	2.9%	4.4%	6.3%		4.0%	2.7%	4.7%
MP/Chhattisgarh	5.9%		6.2%		5.0%	3.9%	7.1%
Odisha	6.0%					8.4%	7.1%
Pun/Cha	5.9%					5.7%	7.1%
Rajasthan	5.6%					5.4%	7.0%
UP/Uttarakhand	3.0%		5.2%		3.7%	3.0%	4.1%
West Bengal	2.8%	5.4%		4.7%		3.6%	3.9%
AP / Telangana	3.7%	7.6%		6.2%		4.9%	5.4%
Karnataka	4.0%	7.7%			6.6%	5.1%	6.1%
Kerala	5.1%		7.8%		12.4%	6.7%	6.9%
TN/Pondicherry	2.8%	7.3%		4.0%		3.7%	4.3%

Table 8. RE Levels Across State Group X Town Class in Sports Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	1.7%	3.4%	4.3%	2.1%	2.3%	1.8%	2.5%
HSM	2.1%	4.2%	3.9%	2.2%	2.7%	2.0%	3.1%
South	2.9%	5.9%	12.4%	4.6%	4.5%	3.7%	4.3%
Assam / North East / Sikkim	8.3%					10.5%	10.0%
Bihar/Jharkhand	11.1%					8.2%	12.1%
Delhi	6.6%	6.6%				6.6%	
Guj / D&D / DNH	5.0%		7.0%		8.7%	5.6%	7.7%
Har/HP/J&K	8.6%					10.4%	10.9%
Mah / Goa	3.8%	7.1%	8.5%		5.5%	4.3%	6.2%
MP/Chhattisgarh	8.4%		9.1%		7.6%	5.9%	11.8%
Odisha	7.2%					10.6%	8.5%
Pun/Cha	8.8%					9.4%	11.3%
Rajasthan	8.8%					9.4%	10.9%
UP/Uttarakhand	5.3%		9.2%		6.0%	5.2%	7.6%
West Bengal	5.0%	8.1%		7.4%		5.9%	9.1%
AP / Telangana	5.4%	10.0%		10.4%		7.7%	7.5%
Karnataka	4.8%	10.2%			7.9%	6.4%	7.0%
Kerala	8.2%		10.4%		16.1%	9.2%	12.7%
TN/Pondicherry	4.7%	10.4%		6.2%		5.4%	8.0%

Table 9. RE Levels Across State Group X Town Class in Infotainment Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	2.7%	5.5%	5.3%	3.3%	4.2%	2.9%	4.8%
HSM	3.0%	6.4%	6.0%	3.8%	4.8%	3.3%	5.3%
South	6.0%	10.6%	16.8%	7.7%	8.6%	6.3%	9.7%
Assam / North East / Sikkim	10.5%					14.6%	12.4%
Bihar/Jharkhand	9.6%					13.0%	18.1%
Delhi	8.6%	8.6%				8.6%	
Guj / D&D / DNH	9.0%		11.5%		16.0%	9.6%	16.2%
Har/HP/J&K	12.4%					14.2%	17.2%
Mah / Goa	5.6%	9.9%	12.1%		9.0%	6.3%	11.3%
MP/Chhattisgarh	7.1%		13.4%		10.9%	8.6%	12.9%
Odisha	13.1%					17.0%	17.2%
Pun/Cha	11.9%					15.7%	21.2%
Rajasthan	16.3%					13.1%	27.6%
UP/Uttarakhand	11.9%		12.1%		10.0%	8.0%	22.6%
West Bengal	7.4%	13.6%		12.0%		10.9%	10.1%
AP / Telangana	11.5%	22.3%		14.7%		12.6%	16.8%
Karnataka	8.4%	16.4%			16.7%	11.9%	11.6%
Kerala	15.2%		21.6%		24.7%	17.1%	20.0%
TN/Pondicherry	6.9%	15.2%		10.3%		8.8%	11.0%

Table 10. RE Levels Across State Group X Town Class in EEC Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	11.4%	19.4%	14.8%	9.2%	11.4%	14.7%	17.0%
HSM	13.0%	21.7%	14.9%	10.5%	13.7%	17.0%	19.7%
South	13.0%	22.7%	42.2%	22.0%	18.2%	16.2%	23.3%
Assam / North East / Sikkim	21.3%					28.3%	28.0%
Bihar/Jharkhand	20.5%					27.9%	90.2%
Delhi	18.4%	18.4%				18.4%	
Guj / D&D / DNH	14.9%		21.9%		25.6%	16.9%	49.7%
Har/HP/J&K	21.5%					28.3%	38.9%
Mah / Goa	16.7%	22.3%	28.2%		23.5%	19.9%	48.2%
MP/Chhattisgarh	16.4%		27.9%		26.1%	22.7%	29.2%
Odisha	29.4%					38.3%	59.2%
Pun/Cha	29.3%					31.1%	50.6%
Rajasthan	26.6%					27.4%	57.9%
UP/Uttarakhand	19.3%		38.8%		28.7%	24.9%	45.7%
West Bengal	64.7%	69.3%		24.7%		78.0%	26.1%
AP / Telangana	18.8%	25.4%		43.1%		21.5%	40.3%
Karnataka	26.1%	41.9%			36.4%	29.6%	36.5%
Kerala	25.6%		40.4%		31.1%	25.9%	49.0%
TN/Pondicherry	23.2%	37.8%		36.7%		27.5%	49.1%

Table 11. RE Levels Across State Group X Town Class in English Movie Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	7.7%	11.7%	12.5%	7.1%	8.5%	6.1%	14.4%
HSM	15.2%	16.1%	21.5%	11.4%	13.1%	9.4%	21.5%
South	6.0%	13.3%	11.5%	7.7%	10.0%	6.8%	12.6%
Assam / North East / Sikkim	18.9%					17.1%	20.5%
Bihar/Jharkhand	38.2%					56.2%	45.6%
Delhi	36.7%	36.7%				36.7%	
Guj / D&D / DNH	20.0%		27.3%		31.5%	21.3%	41.8%
Har/HP/J&K	22.2%					27.6%	35.5%
Mah / Goa	19.1%	24.6%	44.4%		27.9%	18.8%	44.7%
MP/Chhattisgarh	15.8%		29.2%		26.6%	20.4%	48.5%
Odisha	27.8%					35.8%	44.5%
Pun/Cha	26.8%					33.5%	49.6%
Rajasthan	39.9%					31.2%	54.0%
UP/Uttarakhand	24.9%		43.6%		39.4%	34.2%	34.5%
West Bengal	18.4%	20.8%		30.7%		21.0%	47.3%
AP / Telangana	13.3%	29.0%		15.3%		13.8%	26.4%
Karnataka	15.0%	22.8%			25.6%	18.4%	23.2%
Kerala	10.5%		14.9%		20.4%	13.3%	18.2%
TN/Pondicherry	9.7%	17.8%		13.2%		11.0%	21.1%

Table 12. RE Levels Across State Group X Town Class in English News Genre.

Regions	Universe	Metros	10-75L	Below 75L U	Below 10 L U	Urban	Rural
India	3.4%	5.9%	16.7%	7.3%	7.8%	4.8%	5.3%
HSM	5.5%	9.8%	29.6%	10.6%	7.4%	7.6%	8.8%
South	3.9%	6.5%	11.3%	8.2%	9.7%	5.3%	6.0%
Assam / North East / Sikkim	9.8%					13.8%	18.2%
Bihar/Jharkhand	23.6%					23.6%	26.0%
Delhi	10.8%	10.8%				10.8%	
Guj / D&D / DNH	11.2%		16.6%		24.7%	14.7%	18.1%
Har/HP/J&K	11.8%					13.3%	25.3%
Mah / Goa	7.8%	15.3%	17.2%		9.3%	9.1%	17.3%
MP/Chhattisgarh	18.1%		43.3%		20.4%	27.0%	26.6%
Odisha	12.6%					15.2%	31.4%
Pun/Cha	18.8%					24.1%	24.0%
Rajasthan	12.8%					18.1%	20.5%
UP/Uttarakhand	12.4%		18.1%		13.6%	11.3%	17.2%
West Bengal	19.3%	21.0%		25.8%		23.2%	27.1%
AP / Telangana	5.3%	6.6%		8.5%		4.9%	8.4%
Karnataka	6.8%	10.8%			14.7%	9.3%	8.5%
Kerala	11.8%		17.0%		21.4%	15.1%	19.6%
TN/Pondicherry	12.7%	23.0%		15.5%		16.6%	18.0%