GEOPOLL AUDIENCE MEASUREMENT (GAM) METHODOLOGY AND INTERFACE OVERVIEW

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Introduction to GeoPoll Audience Measurement Methodology

GeoPoll is a mobile survey platform and leading global survey provider, reaching a growing network of over 300 million mobile phone subscribers in emerging markets. Through partnerships with telecommunications providers and a multimodal platform powered by mobile text, voice, and web communications, GeoPoll enables companies to gather insight on market trends in specified countries and regions.

GeoPoll uses text message (SMS), voice surveys, and mobile app to collect data from populations in emerging markets, and services include both subscription products and custom surveys. GeoPoll Audience Measurement is a subscription-based product developed by GeoPoll Media which delivers data on TV, Radio, Print/Online audience size, ratings, and share. Data is collected through daily electronic diaries using a mobile application. This report discusses GeoPoll Audience Measurement (GAM) methodology in detail, including the panel selection and representativeness, audience size and ratings calculations, user experience, and the resulting survey output data.

Utility of Mobile Survey Methods

There are several underlying benefits of mobile survey methods including:

- **Real time results:** Results are received in real time and delivered overnight. For GAM, data is uploaded automatically to a web-based user interface. The previous day's data is available the next day at 11am.

- **Ease of response:** Participants respond to polls at their convenience on their own phones.

- **Error minimization:** Answers are typed in via phone keypad and GeoPoll's system immediately checks answers so validation takes place at the time of response and participants are prompted to correct invalid responses.

- **Immediate incentives:** Participants receive airtime credit upon survey completion.

- **High response rates:** GeoPoll's mobile survey panels have high daily response rates of around 50% to 80% depending on the time of day.

- **High retention rates:** GeoPoll's mobile survey panels balance retaining respondents and refreshing them with demographically matched respondents to

provide continuity and consistency. Over one month 60% of respondents are retained, 25% over three months, and 15% over 6 months.

- **Increased access:** GeoPoll surveys participants wherever they are, in remote areas and both in home and out of home. This is particularly important as more than a third of TV viewership in sub-Saharan Africa is often out of home. Additionally, many of these respondents are often hard to reach through face-to-face or internet survey methods.

Detailed Methodology for GeoPoll Audience Measurement

GAM is a digital diary drawn from an active access panel. Participant panels and questions are designed after rigorous experimentation, research, and development by GeoPoll Media. In addition to data collection, GeoPoll provides web-based analysis tools. GAM data is captured in three stages:

1) An open-ended establishment survey is conducted to gather information on the most popular television and radio stations. GeoPoll also codes open-ended questions to determine popular brands for inclusion in psychographic questions, and compares all open-ended results to local field and desk research. This information is then informed by other desk research to create closed-ended questions which include the top stations and brands in each market.

2) An on-boarding questionnaire is developed. This is used to determine panelist eligibility and to capture a wide range of demographic and psychographic data. This survey also includes questions used to calculate the Living Standards Measurement (LSM), or social class scores, most pertinent for each country. GAM uses the pan-African LSM (2004) as the default LSM module in African unless there is another consensus measure for socio-economic status. For example, GAM in Nigeria uses a custom Nigeria-specific LSM module.

3) Closed-ended questionnaires about media and retail behavior are issued daily to the panel. These questions ask about radio listenership, TV watching and other respondent activities in the four hours preceding the survey. Each day respondents are sent a specific version of the questionnaire based on the media topography they are located in. The media topography represents a geographic area of a country that exhibits similar media consumption behavior. These results are then compiled and loaded into the web-based user interface, where they can be reviewed with

GeoPoll's analysis tools. There are three main analysis tools offered to media owners, agencies, and advertisers. The tools are as follows:

- **Online Ratings:** This tool allows clients to view overnight ratings, audience size, and share for TV and radio.

- **Media Evaluation Tool:** This tool allows clients to evaluate the performance of past media plans.

- **Media Planning Tool:** This tool provides historical data for planning media buys.

- **Media Optimizer:** This tool provides suggested locations for TV and radio ad placement to maximize return on investment.

Sample Selection and Representation

GeoPoll Media Measurement is a continuous panel running 365 days a year. It draws from the large database of mobile phone numbers built by GeoPoll in partnership with mobile network operators and recruited from online sources. GeoPoll incrementally invites all individuals with mobile phones to join the GeoPoll service and complete surveys to earn airtime credit and other incentives. GeoPoll also recruits smartphone users online to join standing panels. Once respondents have opted in and completed their first survey, they are geographically and demographically indexed in the GeoPoll user database for future survey engagement. For GAM and other surveying projects, respondents in the GeoPoll user database are sampled to achieve age, gender, location, and socio-economic demographic consistency.

GAM is an access panel-based digital mobile phone survey. Respondents are added to GAM access panels from GeoPoll's user database using the sample techniques detailed below.

Creating GAM Panels

GeoPoll Media take several steps to ensure access panels are representative of a country's geographic and demographic composition. GAM access panels are a combination of random sample from GeoPoll's user database in each country, and also from a random stratified sample where needed. After surveys are taken, where able (see Appendix E for exceptions), GeoPoll weighs the resulting statistics to be representative of the adult population by age groups, gender, and location across each country. GeoPoll constructs GAM panels using the following steps:

1. GeoPoll sends on-boarding surveys to a random sample of respondents in the GeoPoll database in each country. On-boarding surveys invite respondents to complete a set of questions and earn a small airtime credit incentive.

2. If respondents opt-in to the on-boarding surveys, GeoPoll automatically reviews their provided demographic information to determine their eligibility to join the GAM panel.
   a. GAM permits all respondents over the age of 15 in a country to join the access panel. For Trinidad and Tobago, the age will be 18 and above. This permits the audience measurement system to generalize to the total population, including those who only consume media infrequently.

3. Once respondents are determined eligible, GeoPoll adds them to the GAM panel and they start receiving daily surveys the next day.

a. The respondents in the panel are randomly assigned into four time blocks each day. The daily time block surveys of a minimum of 50 completed responses depending on the country, for a total daily panel of around a minimum of 200 completed responses.

b. Each time block covers a four-hour period. Surveys are sent at the end of each four-hour block and ask respondents about their corresponding media consumption in the prior 4 hours.

c. In some countries, there is an optional fifth- or sixth-time block which can cover the evening hours from 10pm to 6am. These are employed when there is sufficient interest in the market for late night watching and are asked the following morning at 10am.

4. As respondents take surveys, the GeoPoll system analyzes the demographic composition and applies post-stratification weights. See next section weighting for more information.

5. GeoPoll reviews the GAM panel makeup daily for representativeness, and as respondents leave the panel (by either not responding to surveys for 7 consecutive days or by opting-out of all surveys), they are replenished using additional demographically similar respondents.

The GAM universe estimate for Trinidad and Tobago includes adults ages 18 and above who have access to a mobile phone. This permits total population media estimates. GeoPoll does not conduct surveys on respondents under the age of 15. The universe estimate is calculated by estimating total adult population (age 18+) in Trinidad and Tobago. In markets where GeoPoll runs in specific regions, the universe is based off the aggregate population of those specific regions, like Nigeria for example. GeoPoll uses adult population estimates from a recent Census. The GAM universe estimate is re-calculated every year, based on changes in country population. The last revision for all markets was March 2017, so the next revision will be no later than April 2018.

Weighing the Sample
Given natural variation in sampling, audience statistics are calculated based on demographic post-stratification weights for each 4-hour time block. GAM weights to an approximate 50/50 gender split. GAM outputs are also weighted by location, either first administrative level (region) or media topography. GAM results are also weighted by age to ensure the proportion of sample between the ages of 15 to 24, 25 to 34, and 35+ match the same estimated proportions in the country. Weighting is tailored to match country specifications so that results are relevant for each unique country. Currently, all GAM countries are weighted for gender, location, and age, except in the two newest 2017 markets: Ethiopia and

Afghanistan, which are weighted by gender and location. As mentioned earlier, country specific weighting information can be found in Appendix E.

Panel Demographics and Psychographics

Demographics & psychographics indexed for each panel include:

- Age (15+)

- Gender

- Ethnicity (in Trinidad and Tobago)

- Media topography and the first administrative political divisions therein

- Living Standards Measurement (2004 Pan African LSM, custom Nigeria LSM, or other industry specified set of questions)

- General media habits, brand preferences, household device ownership, retail Preferences

Survey Questions and Process

Survey Questions

Each survey sent to participants asks about their media consumption in the prior four hours in the media topography they are based. The main modules are 1) radio and 2) TV & retail, as well as 3) Print/Online in select markets. When a respondent receives a survey, the order in which they receive the modules is randomized. Within the TV and the radio modules, to half of the sample the questions are asked in chronological order and to the other half they are asked in reverse chronological order to mitigate the effects of respondent fatigue. The response options to specific questions are also randomized to mitigate any anchoring biases. Respondents who indicate they did not watch TV during the four-hour period are asked a similar amount of questions about their retail behavior the day prior.

If respondents indicate they watched television in a particular 30-minute time period or listened to the radio in a particular 120-minute time period, they are presented with a list of stations and asked to indicate which station they watched or to which station they listened. Survey questions are optimized to be short and easy for self-completion by respondents.

The universe of possible television and radio station list is determined by GeoPoll Media's desk research and internal establishment surveys, in which respondents in each major media topography are surveyed about popular television and radio stations in an open-ended format. The exact number of prompted stations or publications will vary by market, but generally lists consist of up to the top 18 television and up to the top 18 radio stations in each topography, or unique geographic market area. In Kenya and Nigeria, due to sufficient market appetite, and media landscape, regional television stations are also prompted on a per region basis. The determination of which stations are included in the prompted survey questions is based entirely and solely on GAM's internal research and internal annual establishment surveys. GeoPoll also collects and presents "other" answers and systematically reviews them to see if a station not currently named should be added to the prompted lists presented in the survey questions. The results of GeoPoll Media's establishment surveys are available upon request.

Daily Survey Process

Respondents are randomly assigned to one of four different time blocks each day. Every four hours (10:00, 14:00, 18:00, 22:00) GeoPoll surveys participants about their activities in the preceding four hours. Thirty-two 30-minute TV time slots cover the time periods from 06:00 to 22:00, or sixteen hours of the day. Eight two-hour radio time slots cover the same window in most countries, while Radio can have smaller time slots in select countries. GeoPoll does also on occasion conduct next day polls to provide coverage for the hours from 22:00 to 6:00 or a next-day recall survey if there was an issue with a 4-hour diary from the prior day.

Survey Experience

Taking a Survey

- Surveys are sent to respondents via SMS or mobile app, one question at a time as they answer the previous question.

- Respondents will receive the modules in randomized order. Radio is typically asked in two-hour blocks aside from select countries where it is asked in smaller units, while TV is asked in 30-minute blocks.

- Respondents are asked if they watched TV in the four hours prior and if they answer affirmatively, they are asked about the individual 2 hour blocks they watched. They are then asked which television station they watched the most during each 30-minute time period. Respondents are asked about TV consumption in each 30-minute time slot per time bracket starting with either the first 30 minutes of the time bracket and

proceeding chronologically, or the last 30 minutes, and proceeding in the reverse chronological order. This method has been proven by GeoPoll researchers to mitigate a respondent fatigue effect.

- If respondents did not watch TV during the specified 4-hour time block, they are instead asked questions about their retail behavior the day prior.

- Respondents can respond to the survey at their convenience within four hours. They are sent reminder messages after 30 minutes of inactivity. The median response time for each survey is about 10 minutes.

- Participants receive a modest compensation in the form of airtime credit upon survey completion. GeoPoll research has shown that incentives help ensure consistent participation and encourage panel members to answer surveys each day.

- Sample questions can be found in Appendix C.

Language

Surveys are conducted in the most common and appropriate local languages for highest response. Currently, GeoPoll uses the following for our GAM surveys:

      a. Ghana: English
      b. Kenya: English and Swahili
      c. Nigeria: English
      d. Rwanda: Kinyarwanda
      e. Tanzania: Swahili
      f. Uganda: English
      g. Ethiopia: Amharic
      h. Afghanistan: Dari and Pashto
      i. Trinidad and Tobago: English
      j. Ivory Coast: French
      k. Benin: French

User Privacy and Ethics

User privacy and ethics are of paramount importance to GeoPoll. GeoPoll complies with ESOMAR research standards. GeoPoll does not collect names, never shares mobile numbers of respondents, and uses unique identifying codes in databases to represent participants. More information on the Privacy Policy is available here:
http://knowledge.geopoll.com/privacy-policy

Respondent Verification and Quality

GeoPoll respondents are regularly re-polled to confirm they are answering demographic questions consistently and accurately. A portion of GeoPoll respondents are regularly called back to confirm the same demographic characteristics. GeoPoll results are continuously monitored by staff and software to ensure their answers are logical:

Quality Control Points system:
Respondents are flagged and receive a point if any of the following response patterns are identified:
- Contradictory answers
  - Example- If a respondent indicates they watched TV during a larger timer period but then indicates they didn't during the smaller time periods.
- Straight-lining / Satisficing
  - Example- If a respondent replies too often with a certain digit to randomized list of station names.
- Unlikely Viewing Behavior
  - If a respondent selects one station too many times or appears to otherwise not understand the survey.

Any flagged respondents are automatically identified daily by GeoPoll system and manually removed by human reviewer from the system if confirmed to be contributing to erroneous data.

Results

Audience Statistics Available

The data collected permit GAM data to be segmented based on the following measures:

- **Geography:** Geo-referencing is calculated to the topography and first administrative level.

- **Time period:** Data can be filtered to view specified time brackets or periods of time from days to weeks.

- **Demographics:** Gender (male and female) and age ranges of 15 to 24 years, 25 to 34, and over 35 years are also viewable. Custom age ranges are also possible.

- **Psychographics:** Psychographic data includes a collection of consumer buying habits and other user behaviors.

Audience Statistics Calculations

There are three primary audience measures available on the online ratings book tool: Audience, Rating, and Share. These measures are available as average (specific days and times), total (duplicated sum), and cumulative (unduplicated sum). Below are calculations for each measure and an in-depth example of these calculations can be found in Appendix B. All calculations are based on GAM's universe estimate, which is estimated as the adult population of each country for the total panel universe. Medium specific universe can be calculated by multiplying the total panel universe by the proportion of GeoPoll's sample who reported watching TV (people using television or PUT) or listening to the radio in the past 30 days according to the annual establishment survey.

The universe estimate is used to ascertain audience size. The audience size equals the number of respondents reporting watching a station during a given time, divided by the total sample size at that time, multiplied by the universe estimate.

The other two viewing metrics are known as share and rating. Share is the population proportion watching a station during a given time divided by the total number watching at that time. Rating is the population proportion watching a station during a given time, divided by the total sample size multiplied by 100. The rating feature produces a percentage that describes the number of people watching television out of the total sample. Using rating scores, a metric called Gross Rating Points (GRP) is calculated. GRP is the sum of all rating points for a date or set of 30-minute ratings slots.

The share viewing metric is the number of people watching a particular station compared to the number of people watching any station at that time overall. GeoPoll calculates a station's share by dividing the number of people watching a specific station to the number of people who reported watching any television station at that time.

Validity of Results

There are six built-in measures through which GeoPoll verifies results:

- **Questionnaire design:** Prior to designing closed-ended media questionnaires, open-ended establishment surveys are conducted to capture a wide range of stations and brands from respondents. The most frequently cited stations and brands are reflected in daily surveys and in the resulting data.

- **Comparison to national population:** GeoPoll Media researchers compare population estimates to recent Census results where available and U.S. Census Bureau International Program population estimates for 2017.

- **Comparison to recent survey results:** Results are compared to similar audience research studies from organizations such as Kantar, Nielsen, Gallup, IPSOS, Afrobarometer and InterMedia, where such studies are publicly available for a specified country.

- **Inclusion of "other" channels:** All open-ended stations mentioned after participants indicate that they listen to stations other than those listed on the GeoPoll survey are captured, human validated and coded, presented in GAM data and tools.

- **Randomization:** When questions have multiple options where the order does not matter, the GeoPoll system randomizes the ordering of the options. For example, the options for station names are randomized when asked of respondents.

- **Validation with media owners:** GAM has a variety of clients including media owners and advertisers. GeoPoll validates the results regularly with media owners to incorporate their feedback, along with feedback from our advertising agency clients.

GeoPoll Data in Telmar

The GAM methodology combines cross-sectional surveying techniques with panel approaches to provide daily estimates as well impute data to achieve a full weekly diary without overburdening respondents. To provide the full weekly diary for use in the Telmar system and GeoPoll Planning and Evaluation tools, GeoPoll blends larger time periods of GeoPoll Audience Measurement data (commonly monthly and quarterly) to create a simulated one full week with all 4-time blocks completed for each respondent. This is done by combining individuals who share similar LSM, Topographies, Ages, and Genders and treating similar individuals effectively as the same person for that full week even though they have taken different surveys on different days. This process is known as imputing missing data and allows for the computation of reach over a week period, which customers may be more familiar with from one-week diary media measurement data.

Glossary of Terms

- **Audience Size**: The proportion watching a station out of total sample at that time multiplied by total universe estimate.

- **Gross Rating Points (GRPs)**: The sum of all rating points for a particular set of times multiplied by the advertising spots (or shows) that ran during those times.

- **Living Standard Measurement (LSM)**: A way of segmenting markets, grouping people according to their living standards using criteria such as degree of urbanization and ownership of appliances. GeoPoll calculates their LSM using questions including ownership of various appliances, bank account ownership, and technology ownership.

- **Media Owners** Television or Radio broadcasters

- **Media Topography**: Geographic area of a country that exhibits similar media consumption behavior. Grouping smaller administrative units into these large topographies is done on the basis of GeoPoll establishment surveys and desk research in specific markets. Currently, the whole of Kenya is represented by 11 homogenous media consumption regions, Tanzania by 12, and Uganda by 16. Ghana is surveyed nationally in all 10 administrative Regions. Rwanda is surveyed in all four provinces and the capital city area. In Nigeria, GeoPoll currently conducts surveys in 6 states. In Ethiopia and Afghanistan, GeoPoll conducts surveys regionally in 5 provinces. See table below for more details.

Country	Number of Topographies	Names of Topographies
Ghana (national)	10	Ashanti, Greater Accra, Brong Ahafo, Central, Eastern, Northern, Upper East, Upper West, Volta and Western
Kenya (national)	11	Central, Coast, Lake, Lower Eastern, Nairobi, North Eastern, North Western, Rift, South Nyanza, Upper Eastern, Western
Nigeria (regional)	6	Delta, Edo, Federal Capital Territory, Kano, Lagos, Rivers
Rwanda (national)	5	Kigali, Southern Province, Western Province, Northern Province and Eastern Province

Tanzania (national)	12	Central, Coastal, Dar Es Salaam, Kilimanjaro, Lake, Northern, Pemba, Ruvuma, Southern, Southern Highlands, Unguja, Western
Uganda (national)	16	Acholi, Ankole, Bukedi, Bunyoro, Busoga, Eastern Buganda, Elgon, Greater Masaka, Kampala, Karamoja, Kigezi, Lango, North Buganda, Teso, Tooro and West Nile
Ethiopia (regional)	5	Addis Ababa, Oromia, SNNPR, Tigray, Dire Dawa
Afghanistan (regional)	5	Balkh, Herat, Kabul, Kandahar, Nangarhar
Trinidad and Tobago (national)	15	All Trinidad corporations, municipalities, and Tobago island.
Ivory Coast	14	Bas-Sassandra, Goh-Djiboua, Montagnes, Sassandra-Marahoue, Denguele, Savanes, Woroba, Lacs, Vallee du Bandama, Yamoussoukro, Zanzan, Lagunes, Abidjan,Comoe
Benin	12	Alibori, Atakora, Atlantique, Borgou, Collines, Cuoffo, Donga, Littoral, Mono, Ouémé, Plateau, Zou

- **Access Panel Survey**: Type of survey in which demographically similar respondents are drawn from a larger pool of participants at specified intervals over time.

- **People Using TV (PUT)**: The number of panelists watching TV during a given 30-minute slot. For example, 40 of 80 watched TV during a 30-minute slot.

- **Psychographics**: Market research information on panel respondent purchasing, spending, and consumption habits. GAM psychographics include viewing location, planned purchases in the next 90 days, favorite soft drink brand, among others.

- **Random Stratified Sample**: A type of sample which sub-sets or filters to a certain group (for example a specific gender or age group) and then samples within that group rather than sampling from the total sampling pool.

- **Rating**: The proportion watching a station out of total sample at that time, multiplied by 100. If 200 people out of 500 watched Station X, the rating would be (200/500) x 100=40.

- **Sample Size**: The number of completed surveys by eligible panelists. For example, 500 panelists completed the first four-hour time block at 10:00.

- **Share**: The proportion watching a station, out of all of those watching at that time. This is equal to the proportion watching a station during a given time divided by the total number watching at that time.

- **Total Panel Universe Estimate**: The estimated adult population (over age 15) of a given country is the total panel universe as of the methodology changes in 2016. For 2017, the universe estimates were updated based on latest census estimates. In markets where only specific regions are measured, the universe reflects the adult population of those regions as opposed to the entire country. The exception to that is Afghanistan which is asked regionally but audience statistics are extrapolated for the country as a whole.

- **Weighting**: A technical rebalancing that corrects for small natural variations in sampling and response to bring sample statistics (i.e. estimated gender distribution in the survey) in line with known population parameters (i.e. gender distribution from recent national census).

Appendix A: How to Use the Web Interface

Overnight TV and radio audience insights can be viewed on the GeoPoll user interface. The following demonstrates the user interface view. Audience measurement for TV or radio, can be viewed by clicking **View** for the respective Ratings report on the Dashboard.

| TV Ratings | 6/10/2014 | Kenya | View |

Clicking **View** provides access to audience measurement for TV and radio. Data in the chart and data table are controlled with the filters on the left side.
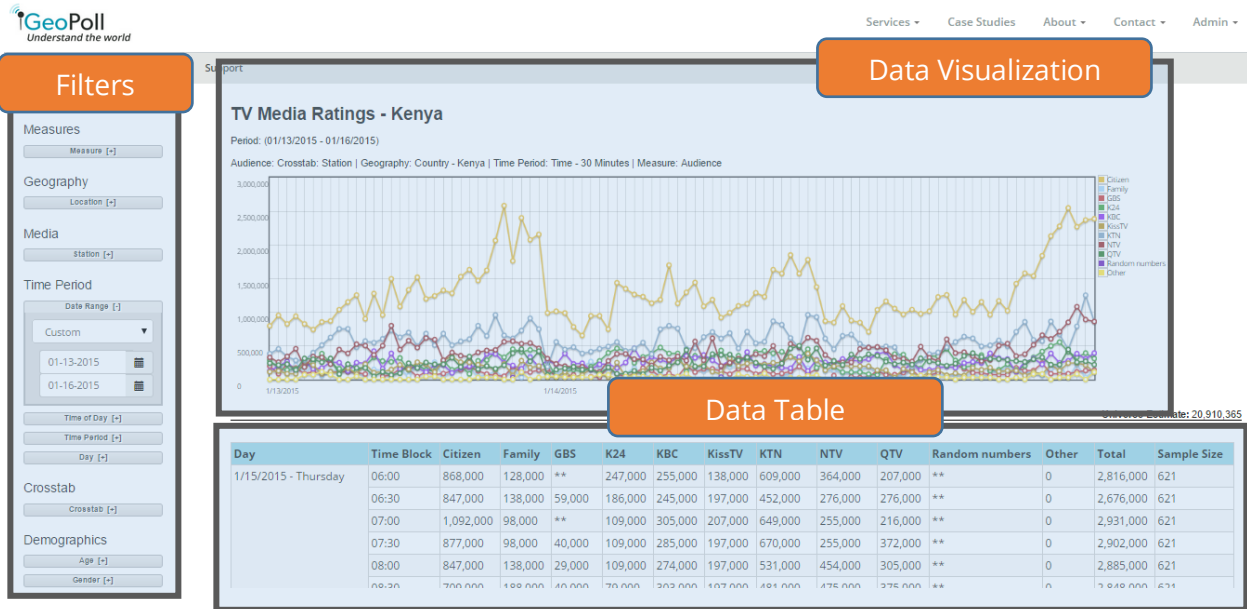
Data: Audience size for a 3-day period

Filters

Filters allow for data to be segmented based on measures, geography, time period, demographics and psychographics. By selecting desired filters, then selecting the **Update** button, a chart and table of the data selected will be produced. Data can be filtered by various criteria including:

- **Measures:** Select audience measurement of interest, including audience size, share, or rating.

- **Location:** Select target regions to view data at a regional level or nationwide. Each country has different segmenting options. These are regionalized, so different stations will appear depending on the region(s) filtered.

- **Stations:** Select one or more top stations in the country.

- **Time Period**: First select the Date Range for data to include for analysis. If a specific timeslot of the day is of interest, choose a custom Time of Day otherwise leave as default Full Day. Then choose how to display the data. The default is 30-minute blocks blending 30 prior days of data in a one-week view, but it can also be rolled-up to a daily, week day, weekly, monthly, or quarterly view, as long as a sufficiently long Date Range has been selected. For the 30-minute block, it is also possible to increase sample size by selecting Blend Days which will blend all days selected in the Date Range. Finally, select a specific day of the week, if of interest.

- **Crosstab**: Filter to view the demographic composition (age, gender, LSM) within each time period of interest.

- **Demographics:** Filter by age, gender, and LSM groups.

- **Psychographics:** A collection of consumer buying habits, and other user behaviors indexed can be compared against demographics, measures, geography, and stations.
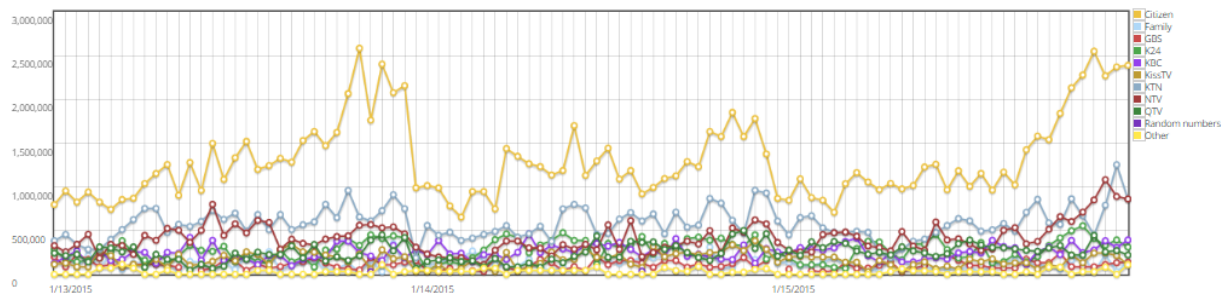
Data Visualization

GeoPoll's charting tool shows clients a visual indicator of selected data over time. The above example shows nationwide data across all stations over 3 days in 30-minute time blocks.

Data Table

Day	Time Block	Citizen	Family	GBS	K24	KBC	KissTV	KTN	NTV	Other	QTV	Total	Sample Size
6/8/2014 - Sunday	06:00	960,000	157,000	**	307,000	150,000	202,000	307,000	230,000	**	144,000	2,457,000	526
	06:30	1,567,000	221,000	29,000	336,000	86,000	86,000	406,000	237,000	**	208,000	3,176,000	526
	07:00	1,030,000	115,000	**	515,000	272,000	93,000	400,000	230,000	**	179,000	2,834,000	526
	07:30	1,129,000	58,000	58,000	636,000	150,000	**	208,000	259,000	**	272,000	2,770,000	526
	08:00	828,000	150,000	58,000	237,000	202,000	29,000	464,000	173,000	29,000	272,000	2,442,000	526

Below the chart, the data selected data over time increments are organized by station and time block in a tabular format. In the above example, nationwide data across all stations over 3 days in 30-minute time blocks is visible. The value for Sample Size shows the number of respondents for the specific time block. The ** markers represent when an audience size is too low to estimate. The interface is highlighted in yellow where sample sizes are low so estimates should be read cautiously.

Appendix B: Viewing Option Example Calculations

Total Universe

=Adult population (26,079,278)

For example, a sample of 100 is drawn estimated to represent these 26M.

Sample Size

=The number of completed surveys by eligible panelists

For example, 80 panelists completed the first four-hour time block at 10:00 am

People Using TV (PUT)

=The number of panelists watching TV during a given 30-minute slot

For example, 40 of 80 watched TV during a 30-minute slot

Share

=The proportion watching a station, out of all of those watching at that time

For example, Station1/ PUT = 10 / 40 = 25%

Rating

=The proportion watching a station out of total sample at that time multiplied by 100

For example, 100* Station1/ Sample Size = 100 * 10 / 80 = 12.5.

To calculate Gross Rating Points (GRPs), this is multiplied by frequency and summed.

Audience Size

=The proportion watching a station out of total sample at that time multiplied by universe

For example, Universe * Station1 / Sample Size = 26,079,278 * 10 / 80 = 3.26M

Appendix C: Sample Survey Questions to Users

The following are examples of questions respondents are asked on GeoPoll surveys. This list is not comprehensive and subject to change on an annual basis but is meant to demonstrate the manner in which questions are asked of survey participants.

Question Type	Question and Options in English	Question and Options in Swahili
Radio Listening 14:00-16:00 Bracket	Did you listen to the radio today from 14:00-16:00? 1) Yes 2) No [Reply with 1 or 2]	Ulisikiliza redio leo kati ya 14:00-16:00? 1) Ndiyo 2) Hapana [Jibu na 1 au 2]
Specific Radio Station Listening (2-hour increments) 14:00-16:00	What radio station did you listen to the longest between 14:00-16:00? 1)Citizen 2) Jambo 3) KissFM 4) QFM 5) Classic 6) Kameme 7) KBC 8) Maisha 9) Ghetto 10) Other	Ulisikiliza stesheni gani ya redio kwa muda mrefu kati ya saa 1400-1600? 1)Citizen 2) Jambo 3) KissFM 4) QFM 5) Classic 6) Kameme 7) KBC 8) Maisha 9) Ghetto 10) Nyingine
Specific TV Watching (30-minute increments) 15:30-16:00	What television station did you watch the longest between 15:30-16:00? 1)Citizen 2) KBC 3) KTN 4) NTV 5) KissTV 6) QTV 7) Family 8) GBS 9) K24 10) Other	Ulitazama stesheni gani ya televisheni kwa muda mrefu kati ya saa 15:30-15:00? 1)Citizen 2) KBC 3) KTN 4) NTV 5) KissTV 6) QTV 7) Family 8) GBS 9) K24 10) Nyingine
Soft Drink Type	What brand of soft drink did you purchase yesterday? 1)Fanta 2) Coca-Cola 3) Sprite 4) Krest 5) Stoney 6) Alvaro 7) Novida 8) Pepsi 9) Other	Ni aina gani ya kinywaji baridi ulinunua jana? Jibu na aina ya kinywaji baridi 1)Fanta 2) Coca-Cola 3) Sprite 4) Krest 5) Stoney 6) Alvaro 7) Novida 8) Pepsi 9) Nyingine

Appendix D: National Representation Sampling Caveats for GeoPoll Audience Measurement

Some demographic segments can be challenging to reach in new markets and hard-to-reach GAM markets. Here are the exceptions to the age, gender, and location sampling and weighting approach by country:

Ghana:
- Female 15-24 in Brong Ahafo, Volta, and Western
- Female 25-34 in Brong Ahafo, Central, Eastern, Northern, Volta, and Western
- Male 25-34 in Volta and Western
- 35+ all locations and both genders

Kenya:
- None

Nigeria:
- Age weighting done for 15-24 and 25+
- Kano Female and Kano Male 25+

Tanzania:
- Female and 35+ in Lake, Northern, Southern, and Southern Highlands

Uganda:
- Age weighting done for 15-24 and 25+
- Northern Female 35+

Afghanistan:
- Currently weighting by Gender and Location but not age group

Ethiopia:
- Currently weighting by Gender and Location but not age group

Rwanda:
- Age weighting done for 15-24 and 25+

Ivory Coast:
- Currently weighting for Age Group and Gender

Benin:

- Currently weighting for Age Group and Gender

Appendix E: Annual GAM Methodology Revisions

Annual reviews and revisions go into effect during Q1 or Q2 each year. This allows us to updates our station list to reflect the most up-to-date top TV stations at the national level, and top radio stations at the regional level, as well as updated universe sizes for the New Year.

Information on the 2017 revisions below:

1. Standard annual update of Prompted TV and Radio stations

- All prompted stations continue to be determined through annual GAM establishment surveys, where the top stations are included in the prompted lists.

2. Increased Number of Prompted TV stations

- All GAM markets now prompt the top 18 TV stations

3. Print and Out of Home now available upon request

- GAM print (newspaper and magazine) data is available as a GAM add-on for interested clients. It is currently available in Kenya and Ghana.
- GAM Out of Home measurement (billboards and outdoor advertisements) data is available as a GAM ad-on for interested clients. It is currently available in Kenya and Uganda.

4. Regionalized Prompted TV Stations

- Regionalized Prompted TV stations are now in effect in Kenya, Ghana and Nigeria

5. Nigeria Expansion

- Increased the number of states in which GeoPoll collects data from 8 to 11. The states are: Lagos, Abuja, Rivers, Oyo, Edo, Abia, Kano, Ondo, Delta, Anambra, and Osun.

6. Enhanced Data Quality Checks

- Updated real-time response analytics to determine validity of responses, and immediate removal of respondents from active panel who are providing unsound responses

In 2018 and 2019, the standard annual updates of prompted TV and Radio stations went into effect in all markets

Additional 2019 changes:

- Nigeria states were reduced to 6. Those states are: Delta, Edo, Federal Capital Territory, Kano, Lagos, Rivers

Appendix F: Trinidad & Tobago SES calculation

All respondents in Trinidad & Tobago are scored for SES (socio-economic status) based on their responses to eight key indicators- ownership of washing machine, dryer, air conditioner, laptop, number of vehicles, travel frequency, education, and income. Points are assigned based on response and each is worth 12.5% of the total calculation (out of 100). Groups are determined based on points using the following table:

Raw Score	SES	% Population
0-30	E	24%
31-52	D	33%
53-65	C	22%
66-79	B	16%
80-100	A	5%