Nielsen

Project manual

ENGLISH 2024

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MEASUREMENT

Norway has measured radio with Personal People Meters (PPMs) since 2006 and with the PPM wearables since Jan 1, 2023. The radio channels have been in the process of moving to DAB+ and Online for all their content. This work was completed at the end of 2017. The radio and audio audience measurements aim is to measure and report all audio, live and time-shifted from the participating media; incorporating broadcast, online and podcast, to meet the current and future needs that reflect the evolving audio landscape.

SERVICE OVERVIEW

Using our patented PPM technology, Nielsen enables a panel to measure all radio and audio listening from participating broadcasters; including DAB, DAB+, online, TV and FM content, as well as listening that happens in-home, out of home, in transit, and in the second home. The small PPM device is carried all day by the panel members. It picks up an inaudible code included in all broadcasts and reports the listening overnight via the telecom network. The listening is reported the following morning to the market.

The reported currency data is delivered via Nielsen's proprietary Audience Measurement Software tool, eRAM, and also made available via easy to digest files by tools like TechEdge.

By combining Nielsen's PPM hardware and software encoders, we are able to measure live linear content as well as on demand and previously broadcast content. As a result, we are able to encode, measure, and deliver currency-grade measurement for all radio and audio listening, irrespective of the method of consumption.

This project manual is designed to describe and document relevant aspects of the audio measurement service to any interested parties. Any changes to the measurement will be updated in this manual.

ESTABLISHMENT SURVEY

As a part of the measurement solution, Nielsen has partnered with Norstat to design and execute a unique, stand-alone Establishment Survey to set the foundation for the measurement. The purpose of the Establishment Survey is to:

- Define the radio listening environment in Norway
- Support the development of Nielsen's Radio Audience Measurement service
- Create a sample frame from which to recruit the panel.

SURVEY SAMPLE SIZE

Different sample sizes are required for the estimation of the radio listening environment and the recruitment of the panel. Accordingly two parallel surveys have been conducted at the same time. Nielsen's partner, Norstat, have therefore conducted 6000 interviews for the Establishment Survey. The first survey was used to assess the radio market besides the goal of delivering address bucket for recruitment and the second survey—known as the pre-recruitment survey—was used to gather additional addresses using a shorter questionnaire for expanding panel sampling frame.

SAMPLE FRAMEWORK AND SAMPLING METHOD

The resident population of Norway aged 10 and older and living in private households is represented in Establishment Survey. Prior to Establishment Survey a random sample of individuals are selected from the Bisnode Matchit database. The sample was a stratified probability sample.

The stratas were specified by:

- Geography (11 counties + four big cities: Oslo, Stavanger, Bergen, Trondheim). Within strata quota requirements were implemented by interlacing
- Age (10-19; 20-29; 30-39; 40-49; 50-64; 65+) and
- Gender
- Household Size (1 person, 2 persons, 3 persons, 4 persons, 5+ persons)

The reason of quota usage that sampling frame contains the age and gender information of subscribers, but he or she is not the same person as the participant of the survey in each case, especially in case of landline phone numbers.

While this approach is an individual person-based sampling approach, demographic information was collected from all members of the household in which the person at the selected phone number resides since Nielsen recruits complete households and at selection procedure estimates for the household members on how strongly fit to necessary panel profile. The basis of Universe estimation is the individual representative sample.

SURVEY INTERVIEWS

At the start of every interview, the interviewer outlined the purpose of the survey and at the end of each interview, informed the interviewee that his/her household may be invited to join the PPM panel at a later date. The average length of an interview was 20 minutes. Main socio-demographic information included:

- Household size;
- Individual socio-demographic characteristics of each household member: gender, age, education, occupation

RADIO EQUIPMENT / INTERNET CAPABLE DEVICES / LISTENING BEHAVIOR:

- FM / DAB radio ownership;
- FM / DAB radio in car;
- FM / DAB radio in second home / cabin / boat;
- Internet connection at home;
- Ownership of PCs, tablets, smartphones;
- Claimed weight of listening, estimation of radio listening level (in and out of the home);
- Use of podcasts;
- Listening via TV;
- Listening via mobile phones

- Radio listening through headphones, headphone type and usage frequency
- Claimed radio listening exclusively through headphone and usage frequency
- Listening to internet audio streaming (e.g. Spotify, Tidal, Youtube, iTunes etc)*

The establishment survey included all information used for panel sample control or weighting control and is estimated from establishment survey. The pre-recruitment survey was limited to information used for panel sample control and maintenance for the next 12 months.

The fieldwork for the establishment and pre-recruitment surveys was executed through computer assisted telephone interviews at Norstat.

WEIGHTING OF ESTABLISHMENT SURVEY

Establishment survey is weighted to balance bias stemming from sampling and refusal. The source of weighting matrix is data from Statistisk Sentralbyrå (SSB) and align the universes are implemented at PPM panel. Since the establishment survey represents inhabitants that are at least 10 years of age living in private households, the population data also reflects this segment of the society.

The following categories are used in the weighting process:

- Gender
- Age (10-19, 20-29, 30-39, 40-49, 50-64, 65+)
- Education (Kids up to 16 year old, below upper secondary, upper secondary, higher education up to 4 year, higher education more than 4 year)
- Type of area (urban, other)
- Household size (1, 2, 3, 4, 5 or more members)

The weighting methodology was an iterative, so called RIM weighting procedure.

ANNUAL SURVEY

The Establishment Survey will deliver a regular update of the radio market and will be refreshed annually. In conducting the Establishment Survey in four quarterly waves throughout the year, we ensure a regular fresh sampling frame for sample recruitment.

UNIVERSE OF MEASUREMENT

In order to report accurate figures for the population's audio consumption, it is of great importance that the composition of the people measured is representative of the universe we are to describe. The universe of PPM panel—similarly to the Establishment Survey—is the resident population of Norway aged 10 and older and living in private households. Nielsen uses Statistisk Sentralbyrå (SSB) as source in terms of defining universe sizes.

The data to be used for panel balancing or weighting is available and updated in official government publications, but making them referring to a specified population required some adjustment.

UNIVERSE SIZES FROM 2024

HOUSEHOLDS	Universe	%	INDIVIDUALS 10+	Universe	%
Total households	**2,581,721**	**100.0**	**Total 10+**	**4,869,705**	**100.0**
Vestfold og Telemark	202,591	7.8	Male	2,450,220	50.3
Oslo	365,777	14.2	Female	2,419,485	49.7
Innlandet	182,098	7.1	10-19 year old	653,477	13.4
Viken	578,028	22.4	20-29 year old	693,674	14.2
Rogaland, Agder	360,936	14.0	30-39 year old	762,389	15.7
Vestland	301,087	11.7	40-49 year old	713,205	14.6
Møre og Romsdal, Trøndelag	357,335	13.8	50-64 year old	1,049,107	21.5
Nordland, Troms, Finnmark	233,869	9.1	65+ Years	997,853	20.5
1 member	1,048,179	40.6	Up to high school	2,826,208	58.0
2 members	800,334	31.0	Higher education/University	1,646,177	33.8
3 members	307,225	11.9	Kid up to 16 y.o	397,320	8.2
4 members	291,734	11.3	Urban type area	2,900,698	59.6
+ 5 members	134,249	5.2	Other municipalities	1,969,007	40.4

We update each universe on Jan 1 of each year. Oslo , Bergen , Trondheim , Stavanger , Bærum , Kristiansand , Fredrikstad, Tromsø , Sandnes , Drammen , Sandefjord , Asker , Sarpsborg , Skien , Lillestrøm , Bodø , Ålesund , Tønsberg , Arendal, Larvik , Halden , Horten , Molde , Kristiansund , Haugesund , Lillehammer , Hamar , Gjøvik , Øygarden , Askøy , Moss, Porsgrunn , Alta , Sunnfjord , Sogndal , Lørenskog , Nordre Follo , Kongsberg , Harstad , Ringerike

HEADPHONE ADJUSTMENT SOLUTION

Nielsen measurement solution will deliver a measurement of total reach. The core PPM service includes measurement of broadcasted radio, time shifted listening for up to 7 days. Consumption of live digital audio and encoded on-demand/podcast content will be included as part of the PPM delivery as long as it is encoded and can be attributed to a particular live channel.

To measure the total reach of audio across digital and traditional radio, we will be introducing a Headphone adjustment solution as part of the core PPM delivery. Essentially, we will be estimating the portion of headphone audio listening that is not measured by the PPM today, and adjusting the figures upwards in a way that is better representative of true consumption. The goal is to calibrate the existing panel audio data and adjust it via a survey and through what Nielsen calls fusion for the headphone listening of digital content in the Norwegian market.

The Norwegian market data is going to be estimated from existing Annual survey , ref survey establishment (approximately 6,000 interviews per year) which will include questions about the how many people are using headphones while listening to the radio, behavior frequency, time spent listening via headphone, which device, which demo profile, in which part of the day, per what station, etc. This will strengthen our model with the population-level probabilities. For a regular update and considering the seasonal effects, the survey will be split into 4 equal quarterly waves, and estimation will be delivered by four rolling waves.

The other source of the information will be the panel itself. During the regular panel demographics update and household recruitment, Nielsen will collect headphone listening behavior information from as many panel households as possible.

Nielsen will use information obtained as described above to build a classification model to quantify the relationship of headphone listening to radio listening and determine differential demographic factors.

Collected information from the panelist where we have a) panelist demographic characteristics and b) panelist headphone listening behavior in addition to c) the incremental survey data, all three data sources will serve as input to support the classification algorithm to learn the mapping function (supervised learning algorithm). The goal is to approximate the mapping function so well that when we have new input data (new panelist), that we can predict the output variables (headphone user segments) for that data.

After headphone user identification in the PPM panel via the classification model (headphone user flag and no headphone user flag) the data will enter the fusion model to fuse listening data. The main assumption during the fusion process is that the non headphone radio listener behavior is similar to headphone listener behavior. This will also be verified during survey and panel data collection.

The Fusion model will define donors/recipients and find linkage variables for matching based on the demographic factor. Essentially, fusion model donates basic behaviors such as:

- Time spent listening
- Station preference

- Type of day/time band listening

From the donor (radio listener in the panel) to the identified/flagged headphone user panelist (headphone user). Final results will calibrate and concurrent listening will be resolved in the last stage.

By introduction the headphone adjustment as part of the PPM delivery:

- A proportion of 0-listeners in today's PPM will be given listening minutes to the extent that they are identified by the model as listeners who only listen to radio through headphones (possible increase of total radio reach to some extent).
- A proportion of current radio listeners in today's PPM panel will be given some extra listening minutes to the extent that they are identified by the model as listeners who partially listen to radio through headphones (possible increase of total radio time spent listening to some extent).

All demographic information that is available as part of existing Nielsen PPM audience measurement will be included. After headphone adjustment modeling the audience data will be in the same granularity level (minute by minute) like today's PPM Measurement.

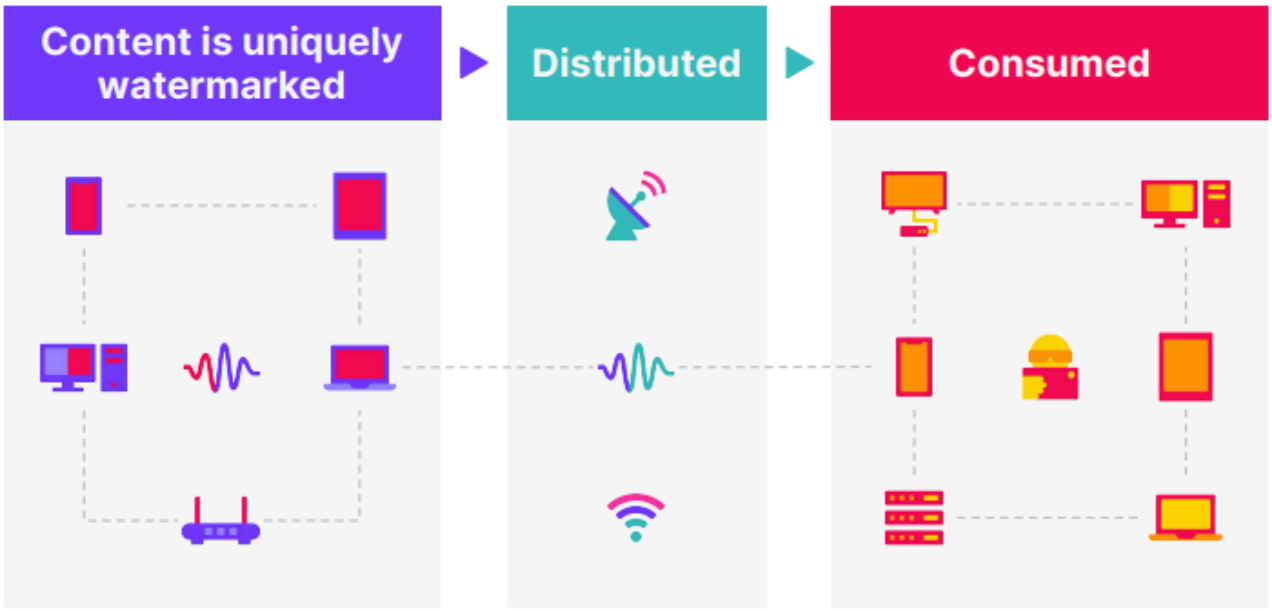
PPM TECHNOLOGY

ENCODING

An encoder, available in analog, digital (AES), and multi-channel digital (AES) varieties, inserts an inaudible audio watermark in the participating parties program material. The watermark, later decoded by the PPM, contains both a unique station identifier as well as a broadcast timestamp. This unique code makes it easy to identify which station the panelist has been listening to even when several stations have the same broadcast content. To differentiate measurement by delivery platform (i.e., DAB, web, TV) the broadcast facility would install a separate encoder (or separate input to the multi-channel digital encoder) on each platform stream to be measured.

The PPM encoding solution additionally offers the flexibility of encoding on multiple layers. A national broadcast could be watermarked with a network layer station identifier while each local feed could be watermarked with a unique local layer station identifier. These watermarks can both be applied to the same audio. Having both layers present will allow for a better understanding of the National audience through the network layer watermark, while still providing the local/regional affiliates a view of their audiences through analysis of the local layer watermark assigned to them.

In order to reduce market depency on physical hardware, software encoders are also made available. The software is integrated within major certified Audio Processors like Omnia, Orban, and Wheatstone. Once certified and integrated, the processors apply the watermarks in the same manner as our hardware encoders.



NIELSEN PPM WEARABLE

Technological advances have opened the way for an upgrade of Nielsen's recognized measurement meter for radio listening, the PPM (portable people meter). PPM is now being launched with a fresh and modern design, with new functions and user-friendly carrying options. The small PPM device is carried all day by the panel members on their wrist, with a clip or as a pendant. It picks up the inaudible code included in all broadcasts and reports the listening overnight via the telecom network.The high-quality microphone in the PPM is designed to detect broadcasts with the encoded signal, and it captures listening even in challenging acoustic environments (close to a human ear). The meter captures motion data via an internal accelerometer which is used to monitor and confirm panelist compliance with the wear and carry instructions.

The transition to PPM Wearables is expected to have a beneficial effect on several parts of radio measurement, including recruitment of panel members, wear time of the meter throughout the day, as well as identification of listening locations.

The PPM Wearable meters are designed especially for media usage measurement. The meters show the time and have a display for easy communication between the panel member and Nielsen's panel team/support. The gauges are easy to use, and are built for maximum battery capacity.

The PPM Wearable is smaller in size than the current 360 PPM. A new and modern design that is more in line with today's wearable technology trends, and contributes to participation in the measurement is even easier than before. The panel member puts on the portable meter in the morning and uses it throughout the day.

Use of location indicators (beacons) ensures that the meters can recognize when radio listening takes place in the primary residence, secondary residence/cottage and/or car.

Listener data from PPM Wearable is transferred to Nielsen every night using bluetooth technology, either via the household's own Nielsen data HUB, or through a specially developed Nielsen Panelist App.

Nielsen PPM Wearables will replace the PPM 360 entirely by the end of 2024.

Magnetic clip	**Pendant** (with lanyard)	**Wristband** (Small & Large)	**Hub to transmit data**	**Metre companion app**
				

PPM PANEL

SAMPLING OF PANELISTS

The Norwegian PPM panel consists of 2,000 reporting panelists.

Any panel should be representative of the universe from which it is selected, both at the time of initial recruitment and thereafter. By representative, Nielsen means that the listening behavior of the panel can be safely used to project the listening behavior of individuals defined in the universe. This can only be achieved if the panel members reflect the range and nature of individuals in the population (universe). Our panel is representative of all individuals aged 10+ that reside in private homes in Norway. The panel excludes institutionalized population: residents of hotels and homes for elderly people, university campuses and the prison population. It also excludes professionals from advertising and media industries.

As a randomly selected sample cannot be perfectly proportional due to different response rate by demo characteristics, the demographics which have a significant impact on radio listening behavior but implicates different response rate of invited people should be controlled. At the selection of panel control categories the maximizing current control set continuity were also be considered. The panel control variables are below.

At a household level:

- Household size
- Region

At an individual level:

- Gender
- Age
- Education
- Urban type area

The categories of the variables match with universe estimation categories.

Nielsen implements a household flooding-based recruitment strategy, through which we recruit all members of the household to participate in the measurement. These households are recruited based on the needs of the panel and the characteristics of the household members.

Nielsen's path to selection is as follows:

- Identify and define required variables and include in panel controls;
- Estimate number of required homes;
- All addresses from the establishment and pre-recruitment surveys are uploaded into a Nielsen database and used for panel recruitment
- Calculate an index ranking the potential households to identify members that best improve the construction of the panel;
- Generate a recruitment list for the panel recruiter. The recruiter must follow the sequential order of the list, with no exceptions, and all effort is applied to successfully recruit the selected households.

Nielsen strictly monitors the installed and reported panel balance by panel control groups and will make all reasonable efforts to correct the should it become unbalanced. The final imbalances are corrected by weighting.

Significant shifts in the media environment and in society in general are expected. Therefore, the methodological approach used to monitor radio audiences has to be flexible and be able to adapt to these changes. The panel control and weighting structures should be reviewed at least once every two years, or annually by analyzing audience behavior in the PPM data.

RECRUITMENT

Nielsen has employed a telephone recruitment (CATI) methodology. All recruiters are specially trained for their roles. During the call the full requirements of the PPM panel is explained and a number of screening questions asked to confirm the potential panelist eligibility to participate in the panel. Panelists cannot be participants of any other market research panel, and no member of the household can be employed in a media-related capacity such as advertising, radio production, etc. After screening, more detailed home information is gathered, including all characteristics that are a part of our panel control variables, panel weighing variables, and reporting segments.

The recruiter is required to explain the service and explain the installation process as well as the panel incentive scheme. The recruiter will also explain the procedure on how to sign an online confidentiality agreement. Upon the successful completion of the recruitment interview, a work order is placed and PPM welcome kit is prepared and mailed to all eligible members of the household individual.

PANEL INSTRUCTIONS FOR CARRYING AND COMPLIANCE

After receiving their PPM Panelist Welcome Kit, panelists are coached to wear or carry the PPM every day, from "rise to retire." The meter captures motion data via an internal accelerometer which is used to monitor and confirm panelist compliance with the wear and carry instructions. Panelists 20+ are considered in-tab for that media day if the meter has 8+ hours of motion and no technical faults. Motion time requirements are not communicated to panelists. Children 10-19 are considered in-tab for that media day if they have 5+ hours of motion and no technical faults. Panelists who do not meet motion requirements are coached to encourage their participation. Various contact methods are used to encourage participation including phone calls, emails, text messages and positive reinforcement. The panelists earn 1 point for every 10 minutes they wear the PPM. Special incentives are used to encourage participation during holidays and summer months when panelists may not follow their normal habits. Only known compliers – those that are intab—are included in the ratings each media day. Those panelists that are not intab for that media day are not included in the ratings. Our radio and PPM specialists review other technical and behavioral data that the PPM sends to provide insights into panelists compliance and proper meter operation.

HEADPHONE LISTENING

The PPM measures wired headphone listening through the use of a headphone adapter. The adapter, which connects to the PPM meter via the micro-USB connector has both a male and female 3.5mm audio connector. The male end is designed to connect to the source device while the female side allows the panelist to connect his/her headphones. When in use, audio is passed through the adapter directly to the headphones with a copy also made available to the PPM via the micro-USB connection. The PPM meter decodes and logs and watermarks embedded in that audio stream while also recording the date/time in which a panelist connects and disconnects the PPM headphone adapter from the PPM.

PANELISTS ON TRAVEL

For panelists who are traveling within Norway: the panelists are instructed to bring their meters with them (including second homes in the country). For panelists traveling abroad (outside of Norway): panelists are coached to notify the

panel teams know and leave their meters at home. Panelists are flagged as “on vacation” and be included in the data as 0 listeners. The remainder of the family will be measured as normal.

IN-HOME, OUT-OF-HOME LISTENING AND SECOND HOME LISTENING

The solution leverages the use of in-home beacons, provided to panelists along with their meters to record meter presence in the home. The in-home beacon, which utilizes Bluetooth technology, plugs into a standard wall outlet in the home. It is always on and features a Bluetooth address that the PPM can use to validate its authenticity as a Nielsen in home beacon. Once validated the meter logs the detection of the beacon and sets a flag to note the time the meter moved in home. This data flows through to our processing systems and allows us to report and differentiate between listening that took place inside the home, outside the home, and as a total. The measurement also includes measuring and reporting listening that happens in second homes with a separate beacon. Ownership of second home will not be used as a panel control. We assume participation by the panelists to place the location beacons in these additional locations is optional and not mandatory. From Jan. 1, 2020, Nielsen also measures in-car listening. An algorithm has been developed and implemented in the PPM device that captures this type of listening using the motion sensor in the PPM device.

DATA CONFIDENTIALITY

It is critical that the identity and characteristics of installed individuals are kept confidential and made available only if necessary. An agreement is signed at the point of installation guaranteeing that Nielsen will maintain the individual’s data in a confidential manner, while also requesting individuals keep their membership private in line with the Norwegian Law.

The file linking panel numbers to names and addresses is secure from unauthorized access and levels of access are granted to users based on the information they require. The system offers different levels of access to users, so that only certain users would have the ability to amend the file. For additional security, the file is encrypted. This is a double safeguard process to ensure the confidentiality of panel member information. If the disclosure of panel member addresses is required (for an external audit, etc.) then parties will be required to sign confidentiality statements and are only given access to information they strictly require to perform their tasks.

PANELIST INCENTIVES

The incentives for individuals that are participating in the Norwegian Radio Audience Measurement will be a combination of a fixed incentive and an added points based incentive for meeting the required PPM wear and carry requirements. Examples include:

- Welcome present: initial bonus for entering the panel
- Points for carrytime: one point for each 10th minute
- 90-day bonus: fixed amount earned for staying in the panel for 90-days
- One-year anniversary bonus: fixed amount for staying in the panel for a year

Nielsen aggregates the points and gives the panelists the opportunity to exchange the points for vouchers and gift cards via an external partner: GoGift.

PANEL REPLACEMENT AND TURNOVER

Nielsen will replace at least 20% of the panel annually (except for the first year of the service).

There are a variety of reasons for panel turnover, including:

- Natural turnover: Losing homes that do not want to participate in the panel any more
- Panel Balance Enforced Turnover: These are households that are within an over-represented control cell
- Quality Control Enforced Turnover: If a person or home consistently needs calling to be re-educated on the compliance rules and behavior does not improve, Nielsen terminates the relationship
- Expiration Based Turnover: Homes and panelists are forced out after a set period of time. Normally, this ranges from two to three years but can be adjusted according to industry preferences.

PPM DATA EDITING

MINUTE BY MINUTE GRANULARITY

Nielsen's PPM solution is designed to report data at a granular level, and will measure and report the contracting party's data on a minute by minute level basis. The PPM meter logs the Media Detections Events (MDEs) at 15-second intervals. These MDEs go through a series of media edit rules to create media episodes. A media episode is listening to a particular media code (encoder at a station) for a period of time (or interval of time). There are two media edit rules that convert the 15-second intervals and round it to a minute level resolution. These edit rules are:

1. Convert 15 to 30 Second Rule: Applies business rule to convert 15-second interval to 30-second interval.
2. Round to Minute Rule: Applies business rule to round the data to a minute level resolution.

TIME-SHIFTED LISTENING

The PPM system determines and reports time shifted listening by comparing the detection time on the PPM meter to the encoded timestamp that is part of the eCBET watermark. The encoded timestamp included in the watermark represents the time that content was originally broadcast. This timestamp, which has a granularity of 1 minute, is embedded as a value that represents the number of minutes that have surpassed since a known date and time (epoch date).

PPM data logs returned nightly to the collection server contain both the time of the watermark detection, as well as the embedded encoder timestamp in the watermark. As this data is processed and listening records are created, both of these timestamps are analyzed to make a decision on whether the record will be reported as live or time-shifted listening.

For time shifted listening, each day we deliver only the incremental listening that occurred up to seven days from the original broadcast. Time-shifted listening up to 28 days is delivered only to private data sets. Time shifted listening on the same day as live is reported as live.

IN-DOCK EDIT

The PPM can detect the encoded broadcasts even when placed in the docking station. As long as the panelist is considered intab for the day, the listening is reported.

LEAD-IN EDIT

A lead-in edit of up to 60 seconds is applied to the data to allow for lag in detection, where a listening statement is preceded by blank time.

LOCATION DATA

Location data (in-home, out of home, in-car, and second home) is merged with media data at the minute-level based on meter clock time of both data streams. Continuous media streams are split if their duration is associated with more than one location.

QUALITY CONTROL

ERROR REPORTING

In addition to the compliance and panelist related controls described above, Nielsen's system supports multiple levels of monitoring and alerting for any errors that occur:

- Automated infrastructure and application monitoring are in place to alert support teams of any issues or errors that impact production

Decision to monitor encoding falls with the broadcasters. Nielsen's PPM solution highly recommends that participating broadcasters monitor live linear feeds to ensure the encoders are properly inserting media codes. Broadcasters are asked to install a hardware encoding monitor, the multi-channel encoding monitor. This monitor provides the capability to monitor four unique signals in a 1RU box and alert the broadcaster through a variety of means (SNMP, web interface, relay closure) to any potential encoding issues. The broadcasters have been advised to connect this monitor into their stations alarm system to be immediately notified of any encoding issues as the responsibility to maintain an encoded signal will be that of the broadcaster.

Once the daily production is finished, a series of Quality Control (QC) checks are made by a dedicated team before releasing data to the market and clients. The checks are put in place before every deliverable so as to prevent unduly redelivery of data. Once checks are completed, an official summary is produced and delivered to the Nielsen Operations team in Norway. In case of a failure of a critical QC check, the Severity 1 process will be initiated, allowing all the needed resources to be allocated for a timely response.

DATA BACKUPS

All requested data is backed up on a daily frequency leveraging our offline cloud storage solution. Retrieval of the backups can be performed on a per request basis using Nielsen's internal tools.

DATA PROCESSING AND WEIGHTING

POLLING

Media day is defined as 3:00:00 a.m. to 2:59:59 a.m. local Norwegian time. Each night after the close of the media day the PPM meters call into the collections portal. The polling window is set to 3:00 a.m. to 5:00 a.m. in the morning for Norway. For data that is not collected during the window (i.e., due to out of range of network, dead battery, etc.) the meter retry every 12 hours until data is successfully polled (if it cannot connect it reboots). PPMs are enabled with roaming-capable SIM cards that leverage the data networks.

To ensure all relevant sample is included, late arriving data from the meters is included in the data for up to seven days following the close of the media day. On the seventh day following collection, the data is considered final. In other words, data is re-stated, reprocessed and re-published for the trailing seven days following the close of the media day, each day.

DATA VALIDATION AND EDITING

Once the data for all meters has been polled and listening statements produced, the data from these individuals is passed through data processing. This system validates the data and then weights it to reflect the population and their listening choices. The process is completed each day and concludes with the delivery of data. The next step is the validation and it comprises of two phases: validating and editing.

WEIGHTING PROCEDURES

Listening data is first validated and edited. Those individuals who pass the validation and editing stage are then moved onto the next stage in the production process. This is the weighting stage, where each individual receives a unique 'weight' denoting how many members of the universe each represents on any given day.

This achieves two objectives:

- Expanding the panel listening data to the universe, to give estimates of the total audience;
- Correcting for any imbalances in the demographic profile of the listening panel compared to the universe.

Imbalances may arise and the weighting scheme will use an algorithm which ensures that individual's weighting takes into account several characteristics of that individual at the same time. Weighting is performed daily.

Nielsen use the method of RIM weighting. In RIM Weighting, also called "Random iterative Method" or scaling, balancing weights are computed for each weighting variable in turn, on a marginal basis. The resulting cells are much larger, more

variables can be weighed and the incidents of zero (empty) interlaced cells is avoided. After a number of iterations through the list of weighting variables, all become simultaneously balanced.

The weighting variable are the followings:

- Gender by age (10-19, 20-29, 30-39, 40-49, 50-65, 65+)
- Education (Below upper secondary, Upper secondary, Higher education up to four years, Higher education more than four year, kids up to 16 year old)
- Type of area (urban, other)

LOG PRODUCTION

To produce commercial and editorial logs, broadcasters deliver post-logs by no later than 0530 AM in order to be reported by 0900 AM for the previous day. Broadcasters upload post-logs to a directory on a Nielsen server. Once delivered, our post-logs processing system will format the post-logs into a common format, apply our internal quality controls, and pass it downstream to produce commercial and editorial logs. The logs contain data like the station, data, start time, end time or duration, etc.

REPORTING POLICY

DAILY DELIVERABLES

Nielsen provides the daily data files in a standardized open format containing required fields that can also be consumed by third-party software. This will include a mapping of all measured stations and markets and listening estimates for all panelists.

OVERNIGHT AUDIENCE DELIVERY AND LOG DATA REPORTING

Data is produced every week day (Monday-Friday) excluding official holidays and weekends.

Nielsen delivers overnight audience data at approximately 0900 AM. for the prior media day and the overnight data with logs at the same time 0900 AM for the previous day.

All overnight and times-shifted listening datasets will be available through agreed reporting software, for analysis along with the aggregated metrics and RLD data.

- Daily data sets are also available in an open pre-defined format for other analysis software provider.
- The public site is also enabled for mobile browsers

REPROCESSED DATA

Reprocessed data including data that is reprocessed due to late-arriving data from the meters overwrites any previous data delivered (so there is only one version of the truth at any given time).

SERVICE VERSIONS

DYNAMIC AD INSERTIONS

From January 2020, dynamically inserted targeted advertising (DIA) may occur in web feeds from the following stations: P4-group stations. For the sake of measurement accuracy, Nielsen has set a maximum limit of two minutes of DIA per hour per station. All stations that at any time exceed this limit in the course of a media day will be asked to report their Dab and web distribution feeds separately, with separate spot logs for GRP reporting. Audio broadcasters using audience-targeted spots are required to report volume to Nielsen and the Media Owner Committee (MOC) for the Norwegian Radio Audience measurement. The MOC is responsible for monitoring and alerting Nielsen when a station may exceed the agreed maximum limit per hour.

IN-CAR LISTENING

Listening in car has been reported as a separate variable, inCAR from Jan. 1, 2020.

P24-7 KOS

Bauer Media has changed name on station Juleradioen to P24-7 KOS. Change active from Dec. 25 2019.

BAUER PLUSS

Bauer Media has added a new station, Bauer Pluss, as a combined variable of their individual web only Pluss-stations. The station will be active in public datasets as from March 26, 2020.

NRK NEWS BROADCAST

Due to the novel coronavirus crisis, NRK has allowed stations that are part of the Norsk Lokalradioforbund (The Norwegian local radio association) to broadcast news content from NRK P1 for a limited time period. Change active from March 18, 2020 and ended May 31st 2020.

NEW CHANNEL LIST FROM 2024

NRK	P4-gruppen	Bauer Media
NRK Nyheter	P4 Lyden av Norge	Radio Norge
NRK Folkemusikk	P5 Hits	Radio 1
NRK Jazz	P6 Rock	Norsk Pop
NRK Klassisk	P7 Klem	Radio Rock
NRK mP3	P8 Pop	Radio Topp 40
NRK P1	P9 Retro	Kiss
NRK P1+	P10 Country	Radio Vinyl
NRK P13 Radioresepsjonen	NRJ	P24-7 Mix
NRK P13		P24-7 Kos
NRK P2		P24-7 Fun
NRK P3X		Bauer Pluss Total
NRK P3		Podplay Total
NRK P3 Urørt		
NRK Radio Super		
NRK Sami Radio		
NRK Sport		
NRK Trafikk		
NRK YR		

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About Nielsen

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