MMS Golden Rules

Panel Data Delivery 1

2026-10-26

Contents

Updates 4

1 Introduction 5

2 Data sources 6

2.1 Daily panel data 6

2.2 DEM_PAN 6

2.3 DEM_ES 6

2.4 SWO_BC 6

2.5 STATION 7

2.6 As-run logs 7

3 Components and definitions 8

3.1 Universe 8

3.2 Sum of weights of possible panel viewers 8

3.3 Target groups 8

3.4 Guest viewers 9

3.5 Activity codes 9

3.6 Station Id's 9

3.7 Total broadcast channel viewing 9

3.8 Device types 9

3.9 Reporting slots 9

3.10 Reporting programs 10

3.11 Reporting ads 11

3.12 Day, week and month 11

3.13 Reach criteria 12

3.14 Panel day 12

4 Catch-up viewing 13

4.1 As Viewed 13

4.2 As Broadcast 14

4.3 Difference from previous MMS Broadcast reporting 14

5 Calculation of metrics 15

5.1 Average viewing time – within one viewing day 15

5.2 Average viewing time – across multiple viewing days 16

5.3 Rating/TRP – within one viewing day 17

5.4 Rating/TRP – across multiple viewing days 18

5.5 Share – within one viewing day 19

5.6 Share – across multiple viewing days 20

5.7 Reach – within one viewing day 21

5.8 Reach and frequency – across multiple viewing days 22

Panel-day 22

Guest viewers 22

Reach criterion 22

Calculation of input parameters 23
Calculation of input frequency distribution 23
Estimate the NBD parameters 25
Adjust the frequency distribution 26
Final adjustment 26
Reach calculation 27
Cumulative reach over time 27

Updates

Version	Paragraph	Update	Date
v1		Document created	2026-06-23
v2	2.3	Updated information about As-run log files.	2026-09-10
	3.9	Updated information about viewing sessions duration in SWO_BC.	
	3.10-3.11	Added information about matching between SWO_BC and BC_As-run	
	5.8	Updated rounding-rule in final calculation step.	
v3	3.13	Updated information about standard reach criteria	2026-09-25
	5.5	Updated formula for Share	
	5.1	Clarification about calculation of Average viewing time in minutes.	
	2	Updated information about data deliveries.	
	5.7	Corrected Calculation step 1. Corresponds to the description in 3.13 *"is **equal** to or greater than the specified threshold".*	
	3.1	Clarification that the exact sum should be used in all metrics, without any roundings.	2026-10-26

1 Introduction

From viewing day 2027-01-01, MMS will provide two different panel data sets that can be used for analysis in external tools:

MMS Panel Data Delivery 1

- Contains audio-matched viewing (live and catch-up), allocated to linear TV channels.
- Includes viewing on TV-screen only.
- Based solely on panel measurement using people meters.
- Intended to be combined with as-run logs for broadcast programs and ads.
- Can be used for both "As broadcast" and "As viewed" type of analyses, but are mainly intended for "As broadcast".
- Replaces the ORPI RV3 and RP3 data deliveries that are available up to and including viewing day 2026-12-31.

MMS Panel Data Delivery 2

- Contains all audio-matched live and catch-up viewing on linear TV channels from MMS Panel Data Delivery 1, together with viewing allocated to streaming services, measured using multiple data sources and measurement techniques.
- Includes viewing on both TV-screen and digital devices.
- A hybrid dataset that combines panel measurement with modelled data in a larger expanded panel.
- Intended for "As viewed" type of analysis.
- Replaces the AAM (Online video), Cross-platform (Total video) and Video-In-Home data deliveries that are available up to and including viewing day 2026-12-31.

This document describes the rules and definitions for calculating audience metrics from **MMS Panel Data Delivery 1**, for viewing data from 2027-01-01 onwards.

The document will replace the MMS Golden Rules TAM which applies to viewing data up to and including 2026-12-31.

Reach calculations cannot be performed across the transition date 2026-12-31/2027-01-01, as the data sources from 2027-01-01 onwards are based on a completely new panel source with no linkage to the previous panel.

The rules and definitions of **MMS Panel Data Delivery 2** will be described in a separate document.

2 Data sources

2.1 Daily panel data

The daily **MMS Panel Data Delivery 1** consists of the following datasets:

Data file	Description
DEM_ PAN	Contains information about the panelists in the MMS Video panel. The file includes one record for each individual panel member (including guest viewers) and contains daily weights, sociodemographic variables, and other relevant panelist information.
DEM_ ES	Contains information about respondents of the Establishment survey. The file structure is equivalent to the DEM_ PAN, to provide universe targets for all target groups available in the MMS Video panel.
SWO_BC	Contains the measured viewing records for each panelist on channel level. The file includes one record for each viewing session and panelist. A viewing session is defined as a continuous unbroken viewing on a specific channel.
STATION	Contains a mapping list between station_id and channels/streaming services.

All files are produced for each viewing day. More details about each data source will be found in the following sections.

2.2 DEM_PAN

The daily DEM_PAN from Panel Data Delivery 1 included all panelists (including guests) in the panel sample, regardless of whether they have actively been viewing or not.

Each unique combination of **household_number** and **individual_number** in DEM_ PAN represents and individual panelist, and this is also the matching key between DEM_PAN and SWO_BC.

2.3 DEM_ES

DEM_ES contains results derived from The Establishment Survey (ES) and is the source of universe targets for all target groups available in the MMS Video panel.

The universe targets are updated twice a year, at beginning of January and July (MMS months as defined in 3.12) . DEM_ES will be delivered daily, but the results will remain constant for all viewing days within the corresponding universe period.

Each combination of **household_number** + **individual_number** represent an individual respondent from the ES. There is no connection between respondents in DEM_ES and panelists in DEM_PAN.

The content in DEM_ES is identical to the DEM_XP_ES file in MMS Panel Data Delivery 2.

2.4 SWO_BC

SWO_BC will include all channels that are reference-banded and measured by audio-matching.

Each record in SWO_BC represents an unbroken viewing session on a specific **station_id** which maps to a channel or a streaming service in STATION.

Each daily SWO_BC includes all viewing belonging to **platform**="Broadcast" within that specific **viewing_date**.

The SWO_BC file for a given date includes the following type of viewing:

- Live viewing of content broadcast on that date (**activity_code**="Live").
- Catch-up viewing, measured on that date, of content originally broadcast earlier on the same date or during the preceding 28 days (**activity_code**="Catch-up").

The matching key between DEM_PAN and SWO_BC are the combination of **household_number** + **individual_number** withing each **viewing_date.**

The panel data can be used to calculate audience metrics at channel level or, when combined with as-run logs as described in section 2.6, at program and ad level.

Channel-level metrics can be calculated for a full day or for specific time slots, with a minimum granularity of one minute slots.

2.5 STATION

STATION includes the channel names and mapping to Media company for all **station_id.**

2.6 As-run logs

The viewing data in SWO_BC can be combined with as-run logs containing information about all programs and spots that have been broadcasted on a specific channel during a day.

By applying the log files, it is possible to identify and report metrics on specific programs/ad-level.

The logs are available for a subset of the channels included in SWO_BC.

- **BC_Content_As-run:** Contains broadcasted programs.
- **BC_Ads_As-run:** Contains broadcasted spots, trailers and sponsorship.

Each daily As-run file covers all broadcasts within a TV-day and should be matched to viewing sessions in SWO_BC with the corresponding **broadcast_date.** The viewing connected to a specific broadcast can take place on different **viewing_dates**, up to 28 days after the live broadcast.

ChannelID in the As-run logs should be joined with **station_id** in SWO_BC.

3 Components and definitions

3.1 Universe

The universe size is a necessary input in all metrics.

This is calculated by summarizing the weights in DEM_ES for each respondent belonging to the selected target group (M), and the universe period corresponding to TV-day (D). It's the exact sum without any roundings that should be used in all metrics.

$$Universe_{M,D} = \sum_{r=1}^{R} w_r$$

Where:
R= Total number of respondents in target group *M*.
w= **weight** for respondent *r* according to DEM_ES.

One unique respondent is defined by the combination of **household_number** and **individual_number** in DEM_ES.

3.2 Sum of weights of possible panel viewers

The sum of weights of possible panel viewers is a necessary input in all metrics.

This is calculated by summarizing the weights in DEM_PAN for each panel-member belonging to the selected target group (M) and the TV-day (D). Guest viewers are to be be excluded.

$$Sum\ of\ weights_{M,D} = \begin{cases} \sum_{p=1}^{P} w_p, & viewer_type = 1 \\ 0, & viewer_type = 2 \end{cases}$$

Where:
P= Total number of panel-members (guests excluded) in target group *M*.
w= **weight** for panel-member *p* according to DEM_PAN.

One unique panelist is defined by the combination of **household_number** and **individual_number** in DEM_PAN.

3.3 Target groups

All available sociodemographic in DEM_PAN and DEM_ES can be used to build target groups and analyse viewing from SWO_BC.

However, the quality of the available variables varies with respect to representativeness, reliability, completeness, and update frequency. Variables that are controlled through panel recruitment and/or weighting generally provide the highest quality for target group analysis. Other variables may be less reliable due to skewed distributions, incomplete reporting, or less frequent updates within the panel.

MMS will provide recommendations for analysis and categorizing the available variables in DEM_PAN according to their expected quality and suitability for target group analysis.

Regardless of the variables used, all target groups should always be calculated in the same way. Calculations should always be performed on the complete selected target group, and not by doing partial calculations on any underlying target modules. This differs from the calculation methodology used for TAM panel data up until 2026-12-31, where certain classes of variables are calculated using slightly different methods.

3.4 Guest viewers

Guest viewers inherit certain sociodemographic information from the panel household they are visiting. Refer to the DEM_PAN file specification for details on which variables are available or not for guests. The variables that are not available will have value "99" for all guest viewers in DEM_PAN.

The guest viewer ID (the combination of **household_number** and **individual_number** in DEM_PAN) is unique only within a specific viewing day. Over time, viewing associated with the same guest viewer ID may therefore originate from different individuals.

As a result, guest viewers must be treated differently from regular panel members in reach and frequency calculations. The specific methodology is described in section 5.8.

Guest viewers should also always be excluded from the sum of weights of possible panel viewers, as described in section 3.2.

3.5 Activity codes

The SWO_BC file includes two different types of viewing activities, "Live" and "Catch-up".

Live viewing refers to viewing that occurs at the same time as the original broadcast.

Catch-up is viewing that takes place after the original broadcast, either later on the same day or within 28 days following the broadcast.

Viewing can be reported either to the viewing time (As viewed), or according to the original broadcast time (As broadcast), as further described in section 4.

3.6 Station Id's

The station_id field in SWO_BC contains the channel code of the TV channel to which viewing has been allocated through the audio matching.

The mapping list between TV channels and station_id will be maintained and provided by MMS.

3.7 Total broadcast channel viewing

Total broadcast channel viewing is defined as the sum of viewing across all channels being measured and reported in the SWO_BC files. No stations ID:s are excluded from this calculation.

3.8 Device types

SWO_BC will only contain viewing from device type TV set. Viewing from digital device types will be included in MMS Panel data delivery 2.

3.9 Reporting slots

The lowest reporting level in the TV audience measurement system is minute.

A viewing session (corresponding to a viewing data statement on SWO_BC) refers to uninterrupted viewing by the same panel member on the same channel.

A viewing session can only be attributed to one single channel. If viewing occurs on more than one channel within the same minute, the entire minute is allocated to the channel with the longest viewing duration during that minute.

If viewing is split equally between two channels within a minute, the minute is allocated to the channel viewed latest within the minute. The resulting channel is then reported to the viewing session in the SWO_BC file.

However, due to deduplication between the TV audience measurement and Online measurement

there will occur cases where the TV viewing session has been reduced with a number of seconds that will be allocated to a measured Online content instead (to be included in MMS Panel Data Delivery 2). This means that the duration of a viewing statement in SWO_BC can be less than 60 seconds, which is a difference compared to the TAM data that are valid up to and including 2026-12-31.

It is always the exact length of the viewing session *in seconds* that should be used in all calculations, without any rounding to whole minutes.

The minimum slot length to be reported on is minute level.

3.10 Reporting programs

The Media companies define the broadcasted programs in as-run log files following common guidelines and deliver these to MMS.

The program start times are rounded to the nearest minute as follows:

- Seconds 00-29 are rounded down to the current minute.
- Seconds 30-59 are rounded up to the next minute.

Program end times are rounded using the same rule.

The duration of a program will always be expressed in whole minutes and is calculated as the difference between the rounded start and end times.

Please note that when matching a viewing session in SWO_BC with a program, it's necessary to account for the exact number of *seconds* of the viewing session that overlaps within the programs rounded start and end times.

Example: A viewing session in SWO_BC has **broadcast_start_time** 14:02:13 and ends at 14:15:00. It is matched to a program in BC_Content_As-run that start at 14:00:00 and end at 14:10:00. The overlapping part of the viewing session will be between 14:02:13-14:10:00, i.e 467 seconds.

Commercial breaks within a program are included in the program length, and consequently also in the audience viewing figures.

3.11 Reporting ads

The audience viewing for a spot/trailer is always based on all viewing during the spot's start minute.

Example: A spot starts at 20:00:20 and has a duration of 60 seconds, ending at 20:01:20. The start minute is 20:00, and the audience rating for the spot is therefore equal to the rating of the slot 20:00:00-20:00:59, regardless of any viewing that overlaps into minute 20:01.

A commercial block or break is defined as an uninterrupted sequence of adjacent spots and or/trailers.

The block extends from the start minute of the first spot/trailer to the start minute of the last spot/trailer in the sequence.

When matching a viewing session in SWO_BC with a spot, it's necessary to account for the exact number of *seconds* of the viewing session that overlaps within the minute corresponding to the spot's start minute.

Example: A viewing session in SWO_BC starts has **broadcast_start_time** 19:59:00 and ends at 20:00:30. It's matched to a spot that starts at 20:00:20 which will therefore receive the rating calculated for the minute 20:00:00-20:00:59. The overlapping seconds of the viewing session will be between 20:00:00 and 20:00:30, i.e 31 seconds to be accounted for in the rating calculation.

3.12 Day, week and month

A television day starts at 02:00 and ends including the minute 25:59. Consequently, viewing between 00:00 and 01:59 is allocated to the previous television day rather than the current calender day.

The SWO_BC for a given day always corresponds to the television day.

A television week starts with a Monday and is always 7 days long.

A television month (also referred to as an "MMS month") can consist of either 4 or 5 television weeks.

In case a television week overlaps two calendar months, the entire week is allocated to the television month containing the majority of the week's days.

A television year always consists of 12 complete television months (January to December), which can cover either 52 or 53 television weeks.

3.13 Reach criteria

Reach calculations can be combined with a reach criterion that specifies the minimum viewing duration required for a viewing session to be included.

A reach criterion is considered fulfilled when the duration of the viewing statement in SWO_BC is equal to or greater than the specified threshold.

The MMS standard reach criterion for broadcast channel viewing from viewing date 2027-01-01 will be the following, based on the reporting type:

	Platform="Broadcast"
Channel/Service	15 seconds
Programs	15 seconds
Ads	5 seconds

3.14 Panel day

A "panel day" is a concept used when calculating reach and frequency across multiple viewing days.

Because the panel sample and panel weights may vary from day to day, a consistent sample must be maintained throughout the entire analysis period. This is achieved by selecting the panel sample from a single day as the basis for the calculation.

This selected day is referred to as the *panel day*.

From viewing day 2027-01-01 onwards, the MMS standard is to always use the **first day** of the analysis period as the panel day.

4 Catch-up viewing

Catch-up viewing refers to viewing that takes place after the original broadcast of a program or advertisement. The viewing is allocated to the original TV channel through audio-matching technology and is included in the SWO_BC file.

The SWO_BC file contains catch-up viewing occurring up to 28 days after the original broadcast.

Each viewing record contains two sets of date and time variables:

- **Viewing variables** (viewing_date, start_time, end_time) describe when the viewing actually took place.
- **Broadcast variables** (broadcast_date, broadcast_start_time, broadcast_end_time) describe when the content was originally broadcast and are used to identify the viewed program or advertisement through the corresponding program and spot logs.

It is important to distinguish between these two time dimensions. A viewing event may occur on one day, while the content being viewed was originally broadcast several days earlier.

Example: A program is broadcast on Monday at 20:00. A viewer watches the program on Thursday at 21:00 using a catch-up service. This means that:

- The viewing date is Thursday.
- The broadcast date is Monday.
- The viewing is included in the SWO_BC file for Thursday.
- The program being viewed is identified through connection between the broadcast information and the as-run program log for Monday.

Viewing of on-demand content from streaming services is not included in MMS Panel Data Delivery 1. Such viewing is allocated to the corresponding streaming service and is included in MMS Panel Data Delivery 2.

The catch-up viewing data in MMS Panel Data Delivery 1 can be analysed from two different reporting perspectives:

- **As Viewed:** viewing is reported according to when it actually occurred.
- **As Broadcast:** viewing is reported according to when the content was originally broadcast.

The same viewing event may therefore contribute to different reporting periods depending on the selected reporting perspective.

4.1 As Viewed

The **As Viewed** reporting perspective measures viewing according to the actual date and time when the audience watched the content, regardless of when it was originally broadcast.

Viewing is therefore attributed to the viewing day and viewing time recorded in the SWO_BC file.

This reporting perspective can answer questions such as:

- How much viewing took place yesterday?
- What was the audience level at a specific time of day?
- How much video consumption occurred during a given period?

As Viewed reporting is particularly important in cross-platform measurement, where the concept of a broadcast schedule does not exist for video-on-demand services.

The SWO_BC file for a given day represents all viewing that occurred on that day and was allocated to TV channels through audio matching. To calculate viewing for longer periods, such as a week or month, the corresponding SWO_BC files for all viewing days within the period should be combined.

4.2 As Broadcast

The **As Broadcast** reporting perspective reports viewing in relation to the original broadcast.

Both live and catch-up viewing are reported against the original broadcast, rather than the date and time when the viewing actually took place.

This reporting perspective answers questions such as:

- What was the audience for a specific program broadcast within a given consolidation period?
- How much viewing did a specific commercial spot generate?

To calculate As Broadcast viewing, all viewing records associated with a specific broadcast are selected and aggregated over a defined consolidation period. The consolidation period may range from 0 to 27 viewing days after the original broadcast.

Example: If a program is broadcast on Monday and reported with a 7-day consolidation period, the calculation must include viewing from Monday (live viewing and same-day catch-up viewing) and the following seven viewing days.

As a results, data from eight SWO_BC files are required to calculate the complete consolidated audience for the broadcast.

4.3 Difference from previous MMS Broadcast reporting

The As Broadcast concept is similar to the reporting of time-shifted viewing used in MMS Broadcast Measurement up to and including viewing day 2026-12-31. However, the underlying calculation methodology differs.

In the methodology used up to 2026-12-31, time-shifted viewing was first reallocated from the viewing time to the broadcast time and then treated as if all viewing had occurred on the broadcast day. Consequently, consolidated reach for a broadcast date was calculated using a single-day reach methodology, even though the viewing may have originated from multiple viewing days.

In the As Broadcast methodology introduced from 2027-01-01, viewing is not conceptually moved to the broadcast day before calculation. Instead, all viewing associated with the selected broadcast is identified and analysed across the viewing days included in the consolidation period.

As a consequence, reach and frequency for consolidated broadcasts are calculated using the same principles as reach and frequency across multiple viewing days. This approach more accurately reflects the fact that viewers may consume the content on different days throughout the consolidation period.

5 Calculation of metrics

5.1 Average viewing time – within one viewing day

Average viewing time is the viewing time in average per individual in the target population.

The first step is the accumulator (A) of weighted viewing time per viewing day d which after universe-adjustment gives the sum of viewing time in step 2.

The sum of viewing time is then rounded and divided with the universe target in step 3.

The final metric could be reported in either seconds or minutes, but the standard is minutes.

Calculation within a viewing day		
Calculation step		**Calculation**
1	$\boldsymbol{A_{m,d}}$	$\sum_{v=1}^{V}(t_v * w_p)$
2	$\boldsymbol{Sum\ of\ viewing\ time_{m,d}}$	$\left(A_{m,d} * \frac{U_{m,d}}{W_{m,d}}\right)$
3	$\boldsymbol{Average\ viewing\ time_{m,d}}$	$(\frac{round(Sum\ of\ viewing\ time_{m,d})}{U_{m,d}})/60$

Where:

V= Total number of viewing statements v in SWO_BC-file.
t= Number of seconds for viewing statement v that matches the slot being measured.
w= Weight for panelist p according to DEM_PAN-file.
U= The universe size of the target-group M as described in 3.1.
W= The sum of weights of possible panel-viewers in target-group M as described in 3.2.

5.2 Average viewing time – across multiple viewing days

This section describes how to calculate viewing time across a period of *d1+d2+…+dn* viewing days.

Step 1 is to summarize the sum of viewing time per each viewing day *d* as described in section 5.1

The total sum of viewing time across the complete period is then divided by the universe target valid on the first day, *d1*, of the period.

Calculation across multiple viewing days		
Calculation step		**Calculation**
1	$\boldsymbol{Sum\ of\ viewing\ time_{m,(d1+d2+\cdots+dn)}}$	$\sum_{d=1}^{n} round(Sum\ of\ viewing\ time_{\boldsymbol{m,d}})$
2	$\boldsymbol{Average\ viewing\ time_{m,(d1+d2+\cdots+dn)}}$	$(\frac{Sum\ of\ viewing\ time_{\boldsymbol{m,(d1+d2+\cdots+dn)}}}{U_{m,d1}})/60$

5.3 Rating/TRP – within one viewing day

Rating is defined as the average number of viewers per time unit across a specific time slot. Rating is non-unique measure of the program's average audience size, where the intensity of viewing time has been considered.

The first two steps are equal to the calculation of average viewing time, where the accumulator (A) of weighted viewing time is calculated in step 1 and universe-adjusted into sum of viewing time in step 2.

Then sum of viewing time is then divided with the length of the slot being measured, and then rounded into integer in order to get the absolute rating.

The absolute rating from step 3 can be divided with the universe target to get the relative rating within the selected target group.

Calculation within a viewing day		
Calculation step		**Calculation**
1	$\boldsymbol{A_{m,d}}$	$\sum_{v=1}^{V}(t_v * w_p)$
2	$\boldsymbol{Sum\ of\ viewing\ time_{m,d}}$	$\left(A_{m,d} * \frac{U_{m,d}}{W_{m,d}}\right)$
3	$\boldsymbol{Absolute\ rating_{m,d}}$	$round\left(\frac{Sum\ of\ viewing\ time_{m,d}}{L}\right)$
4	$\boldsymbol{Relative\ rating_{m,d}}$	$\frac{Absolute\ rating_{m,d}}{U_{m,d}}$

Where:

V= Total number of viewing statements v in SWO_BC-file.
t= Number of seconds for viewing statement v that matches the slot being measured.
w= Weight for panelist p according to DEM_PAN-file.
U= The universe size of the target-group M as described in 3.1.
W= The sum of weights of possible panel-viewers in target-group M as described in 3.2.
L= Length of the measured slot in seconds.

5.4 Rating/TRP – across multiple viewing days

This section describes how to calculate rating across a period of *n* (*d1* to *dn*) viewing days.

The absolute rating for period d1+d2+…+dn is just equal to the sum of absolute rating for each day *d* as calculated in 5.3.

The relative rating is then obtained by dividing the summarized absolute rating across the period with the universe target valid on the first day, *d1*, of the period.

Calculation across multiple viewing days		
Calculation step		**Calculation**
1	$\boldsymbol{Absolute\ rating_{m,(d1+d2+\cdots+dn)}}$	$\sum_{d=1}^{n}(Absolute\ rating_{\boldsymbol{m,d}})$
2	$\boldsymbol{Relative\ rating_{m,(d1+d2+\cdots+dn)}}$	$\frac{Absolute\ rating_{\boldsymbol{m,(d1+d2+\cdots+dn)}}}{U_{m,d1}}$

5.5 Share – within one viewing day

Share is the calculation of a specific channels share of the total viewing time for all channels during a specific slot.

$$Share_{m,c} = \frac{Sum\ of\ viewing\ time_{m,c}}{Sum\ of\ viewing\ time_{m,T}}$$

Like the other time-based metrics rating and average viewing time, it's based on the sum of viewing time in seconds. This is being calculated both for the channel to be measured (*c),* and in total for *all* channels (*T)* included in SWO_BC.

The share for channel *c* is then calculated as the ratio between the two sums.

Calculation within a viewing day		
Calculation step		**Calculation**
1	$\boldsymbol{A_{m,d,c}}$	$\sum_{v=1}^{V}(t_v * w_p)$
2	$\boldsymbol{Sum\ of\ viewing\ time_{m,d,c}}$	$round\left(A_{m,d} * \frac{U_{m,d}}{W_{m,d}}\right)$
3	$\boldsymbol{Sum\ of\ viewing\ time_{m,d,T}}$	$\sum_{c=1}^{C} Sum\ of\ viewing\ time_{\boldsymbol{m,d,c}}$
4	$\boldsymbol{Share_{m,d,c}}$	$\frac{Sum\ of\ viewing\ time_{m,d,c}}{Sum\ of\ viewing\ time_{m,d,T}}$

Where:

c= Denotes the specific channel being measured.
T= Denotes the total across all channels included in SWO_BC.
V= Total number of viewing statements *v* in SWO_BC.
t= Number of seconds for viewing statement *v* that matches the slot being measured.
w= Weight for panelist *p* according to DEM_PAN-file.
U= The universe size of the target-group *M* as described in 3.1.
W= The sum of weights of possible panel-viewers in target-group *M* as described in 3.2.

5.6 Share – across multiple viewing days

This section describes how to calculate share across a period of n ($d1$ to dn) viewing days.

The rounded sum of viewing time for each day d is summarized into the total sum of viewing time for period d1+d2+…+dn. This is being done for both the specific channel c, and for the total viewing time across all channels T.

These two sums are divided to get the share for channel c across the complete period of d1+d2+…+dn.

Calculation across multiple viewing days		
Calculation step		**Calculation**
1	$\boldsymbol{Sum\ of\ viewing\ time_{m,(d1+d2+\cdots+dn),c}}$	$\sum_{d=1}^{n} Sum\ of\ viewing\ time_{\boldsymbol{m,d,c}}$
2	$\boldsymbol{Share_{m,(d1+d2+\cdots+dn),c}}$	$\frac{Sum\ of\ viewing\ time_{m,(d1+d2+\cdots+dn),c}}{Sum\ of\ viewing\ time_{m,(d1+d2+\cdots+dn),T}}$

5.7 Reach – within one viewing day

This metric calculates the number of unique individuals that has been reached during a specific slot. Each viewer shall only be counted once, regardless the number of times the panelist has watched during the slot being measured.

The reach calculation can be combined with a reach criterion stating that the panelist needs to have been viewing for at least X continuous seconds to be included.

The weights of all unique panelists are summarized into the sum of weighted viewers in step 1.

In step 2 this is universe-adjusted and then rounded into the absolute number of reached individuals.

The relative reach is calculated by dividing the absolute reach from step 2 with the universe target.

Calculation within a viewing day		
Calculation step		**Calculation**
1	$\boldsymbol{Weighted\ viewers_{m,d}}$	$\sum_{p=1}^{P} w_p * D_{p,v}$ $D_{p,v} = \begin{cases} 1, & if\ v_i = v_1\ and\ t \geq c \\ 0, & else \end{cases}$
2	$\boldsymbol{Absolute\ reach_{m,d}}$	$round\left(Weighted\ viewers_{m,d} * \frac{U_{m,d}}{W_{m,d}}\right)$
3	$\boldsymbol{Relative\ reach_{m,d}}$	$\frac{Absolute\ reach_{m,d}}{U_{m,d}}$

Where:
P= Total number of panel-members (guests included) in selected target-group *m.*
w= Weight for panelist *p* according to DEM_PAN file*.*
v= Viewing statement for panelist *p* in SWO_BC that matches the selection criteria.
t= Length in seconds for viewing statement *v.*
c= Reach criterion in seconds
U= The universe size of the target-group *M* as described in 3.1.
W= The sum of weights of possible panel-viewers (guests excluded) in target-group *M* as described in 3.2.
D= A 'dummy'-variable that indicates if the panel-members viewing statement ***v*** should be considered in the reach calculation or not. Each individual panelist should only be counted once.

5.8 Reach and frequency – across multiple viewing days

This section describes the calculation of unique viewers and frequency distribution over a period across multiple viewing days.

The calculation of reach across multiple days are more complex and involves several more steps compared to when reach is calculated for a single slot within one viewing day (5.7).

Panel-day

In this kind of calculation, a certain *panel-day* should be used, as described in section 3. 14.The official standard is to use the **first day** of the selected period as the panel-day.

Example: The selected period for the analysis is 20270101-20270107. In this case 20270101 will be used as the panel-day.

The base for the calculation is the set of all possible panelists, including the guest viewers, and their weights, from DEM_PAN belonging to the panel-day. Only this set of panelists and their viewing during the selected period are to be considered in the reach calculation. Any viewing made by a panelist not belonging to the panel-day should not be part of the calculation.

To correct for differences between the reporting samples for each specific day and the used sample belonging to the panel-day, MMS will use the negative binomial distribution (NBD) to model the final frequency distribution.

Panelists that belong to the selected target group on the panel-day should be included in the calculation of "raw rating" and the frequency distribution F_i across the complete period, even if their sociodemographic information happens to change during the period.

Guest viewers

Viewing from guest viewers should *only* be included on the panel-day. Any viewing during other days of the period belonging to guest viewers should be discarded from the calculation.

That means that guests will only contribute with viewing on the first day of the period, and be accounted for as "one time viewers" in terms of frequency of viewed days.

Reach criterion

The calculation of reach across multiple days can be combined with a reach criterion in a similar way as for reach single slot.
The calculation of the frequency distribution F_i should then be limited to the set of viewing statements where the viewing length is equal to or longer than the specified reach criterion.

Calculation of input parameters

The first step is to calculate the input parameters "true" and "raw" rating needed for the NBD modelling.

The "true" rating equals the sum of absolute rating across the complete period for the specific slot S being measured. It is calculated as described in section 5.4.

The "raw" rating is calculated in a similar way, but with one important difference. Only viewing statements belonging to panelists included in the reporting sample of the panel-day (*d1*) should be considered. As described on previous page, the viewing from guest viewers is only included in the raw rating for day *d1*.

The weights from panel-day *d1* is used for all days d1+d2+…+dn when calculating the raw rating.

Calculation step		**Calculation**
1	$True_{S,(\boldsymbol{d1+d2+\cdots+dn})}$	$\sum_{d=1}^{n} Absolute\ rating_{S,d}$
2	$Raw_{S,(\boldsymbol{d1+d2+\cdots+dn})}$	$\sum_{d=1}^{n} Absolut\ raw\ rating_{S,d}$

Calculation of input frequency distribution

The input frequency distribution is calculated by counting the number of viewed slots during the period, for each panelist belonging to the DEM_PAN reporting panel sample for panel-day d1.

For "as viewed" reporting, the frequency distribution should always be defined as the number of unique viewing days during the selected period.

For "as broadcast" reporting, it is possible to define the frequency distribution either in terms of viewing days during the selected period, or as number of unique time slots, depending on the reporting purpose.

Viewing from guest viewers should only be accounted for during panel-day d1.

The frequency vector is calculated by summarizing the weights for all panelists who have viewed exactly 1, exactly 2,…, exactly n number of viewing days/time slots.

Calculation step		**Calculation**
1	$\boldsymbol{F_i}$	$\sum_{p=1}^{P} pw_p$ for $i = 1,2,3,\ldots,n$

Where:
P= Total number of possible panelists (guests included) belonging to the panel-day, according to DEM_ PAN.
pw= Weight for panelist p at the panel-day
i= Number of viewed viewing days/time slots within the period. Only viewing from the panel-day should be included for the guests.

The absolute frequency vector $\boldsymbol{F_i}$ is converted into the relative frequency distribution $\boldsymbol{Fr_i}$ by dividing each element of the frequency vector with the universe target of the selected target group *m*:

Calculation step		Calculation
1	$\boldsymbol{Fr_i}$	$Fr_i = \frac{F_i}{U_m}$ $for\ i = 1,2,3,\dots,n$

Then derive the share of individuals watching exactly 0 viewing days/time slots during the period by summarizing all elements of $\boldsymbol{Fr_i}$, and subtract this from 1:

Calculation step		Calculation
1	$\boldsymbol{Fr_0}$	$Fr_0 = 1 - \sum_{i=1}^{n} Fr_i$

Special case rule: If $\sum_{i=1}^{n} Fr_i > 1$, let element $Fr_0 = 0$.

Add element Fr_0 to the frequency vector Fr to make it cover i= 0,1,2,…,n number of active viewing days/time slots.

Special case rule: In case vector Fr begins with one or more elements where $Fr_i = 0$, these should be removed from the frequency vector before applying the probability model in the following steps.

Example: Assume the following relative frequency distribution:
Exactly 0 slots: 0
Exactly 1 slot: 0
Exactly 2 slots: 0.5
Exactly 3 slots: 0.4
Exactly 4 slots: 0
Exactly 5 slots: 0.1
Since the distribution begins with two elements with value 0, these two elements should be removed from the frequency vector. The remaining Fr_i will then cover the counts i= 2,3,4,5.

Estimate the NBD parameters

Calculate the relative version of the input parameter *Raw*, by dividing it with the universe target of the relevant target-group on the panel-day d1.

Calculation step		Calculation
1	$RawR_{S,(\boldsymbol{d1+d2+\cdots+dn})}$	$\frac{Raw_{S,(\boldsymbol{d1+d2+\cdots+dn})}}{U_{m,d1}}$

Based on element Fr_0 and $RawR$ can the first NBD parameter k be estimated as:

Calculation step		Calculation
1	$\boldsymbol{k}$	$k = abs\left[-\frac{RawR * ln(Fr_0)}{ln(Fr_0) - RawR * W_{-1}[\frac{Fr_0^{(\frac{1}{RawR})} * ln(Fr_0)}{RawR}]}\right]$

Where:

W_{-1}[ ]= The Lambert W function (using the secondary branch).

Special case rule: If $k > 120$, let $k = 120$.

Then the following NBD parameters a and b can be solved for as:

Calculation step		Calculation
1	$\boldsymbol{a}$	$\frac{\frac{Raw}{k}}{U_{m,d1}}$
2	$\boldsymbol{b}$	$a * \frac{True}{Raw}$

Where:
Raw: The input parameter of raw absolute rating
True: The input parameter of true absolute rating
U: The universe target for target group m valid on panel-day d1.

With a and b the NBD probabilities *p_raw* and *p_true* can be calculated as:

Calculation step		Calculation
1	***p_raw***	$\frac{a}{(a+1)}$
2	***p_true***	$\frac{b}{(b+1)}$

Adjust the frequency distribution

With all needed NBD parameters, each element of the frequency distribution Fr will be adjusted by using the function of the negative binomial distribution:

Calculation step		Calculation
1	$\widehat{Fr}_i$	$\frac{\Gamma(k+i)}{\mathrm{i!}\,\Gamma(\mathrm{k})}[(p_true)^i(1-p_true)^k-(p_raw)^i(1-p_raw)^k]+Fr_i$

Where:

Γ( )= Gamma function.

Final adjustment

The next step is to adjust the sum of the adjusted frequency distribution $\widehat{Fr}$ to equal 1 (=100% of the universe).

In case the sum of $\widehat{Fr}_i \neq 1$, the difference should be added by adjusting the last, n^{th}, element of the frequency distribution:

Calculation step		Calculation
1	**Sum of adjusted frequency vector**	$\sum_{i=0}^{n}\widehat{Fr}_i$
2	**Adjust $\widehat{Fr}_n$ in case the sum ≠1**	$\widehat{Fr}_n+\left(1-\sum_{i=0}^{n}\widehat{Fr}_i\right)$

Special case rule: In case any elements of the frequency distribution were removed due to the special case rule described above under "Calculation of input frequency distribution", these should now be included again (with their values of 0) to make the full adjusted frequency distribution $\widehat{Fr}_i$ cover the complete number of *i*=0,1,2,…,n viewing days/time slots.

Reach calculation

The absolute adjusted frequency distribution is calculated by factoring each element of the relative frequency distribution $\widehat{Fr}$ with the universe target valid on the panel-day d1, and adjust it with the ratio of universe targets and sum of panel weight.

This is being done for the elements $i = 1,2, \dots, n$, i.e the share of individuals who have watched at least one of the viewing days/time slots within the selected period.

The absolute number of reach viewers is then obtained by summarizing the absolute frequency vector $\hat{F}_i$.

Finally, the relative reach can be calculated by dividing the absolute reach with the universe target from the panel day.

Calculation step		Calculation
1	$\hat{F}_i$	$\widehat{Fr}_i * U_{m,d1} * (U_{m,d1}/W_{m,d1})$
2	$\boldsymbol{Absolute\ reach_{m,(d1+d2+\cdots+dn)}}$	$round(\sum_{i=1}^{n} \hat{F}_i)$
3	$\boldsymbol{Relative\ reach_{m,(d1+d2+\cdots+dn)}}$	$\frac{Absolute\ reach_{,m,(d1+d2+\cdots+dn)}}{U_{m,d1}}$

Cumulative reach over time

The reach calculation can be used to display the growth of additional viewers day by day (or slot by slot) for the selection of slots.

All above steps including calculation of input parameters, estimating NBD parameters and final reach calculations needs to be done in an iterative way adding each new viewing day/time slot one at a time as s1, s1+s2,s1+s2+s3 etc up until the complete number of viewing days/time slots of the selection.

The panel-day is chosen on the complete selected period and should be used for each specific iteration within the period.