Computation of hearing aid use persistence

In order to calculate hearing aid use persistence, it was necessary to define the period of time $D_{dose}$ for which a ‘prescribed dose’ provides therapeutic cover. Here, this is the duration of hearing aid use which a battery order is deemed to cover. In the case of VA, a supply of batteries is calibrated to last for six months of fulltime hearing aid use, hence $D_{dose} = 6$ months. It is also customary to define $G_{acc}$, the ‘acceptable gap’ in medication possession. $G_{acc}$ is dependent on the health condition and therapy in question. We chose $G_{acc} = 12$ months, indicating that we considered hearing aid use to be ongoing if a new battery order takes place at most $D_{dose} + G_{acc}$, (or 6+12=18) months after the prior battery order. While this might seem liberal, it can be considered to equate to an average of 1/3 full-time hearing aid use over the 18-month period, rather than indicating fulltime use followed by a long period of non-use.

Thus, a patient is ‘persistent’ at time $T$ after the hearing-aid fitting if $T < t_{last} + D_{dose} + G_{acc}$ where $t_{last}$ is the time of the most recent battery order before $T$, and $D_{dose}$ and $G_{acc}$ are as defined above.

The proportion of persistent hearing-aid users at time $T$ after hearing-aid fitting is then the ratio of (persistent patients)/(all patients), where all patients are those for whom $T$ is before 2017/12/31 and who have not died before $T$. In the main text, this proportion is termed ‘Persistence’ at time $T$. 

In this example, it might be difficult to determine the exact time of the most recent battery order, but if you have access to the database, you could estimate this based on the dates of the battery orders.