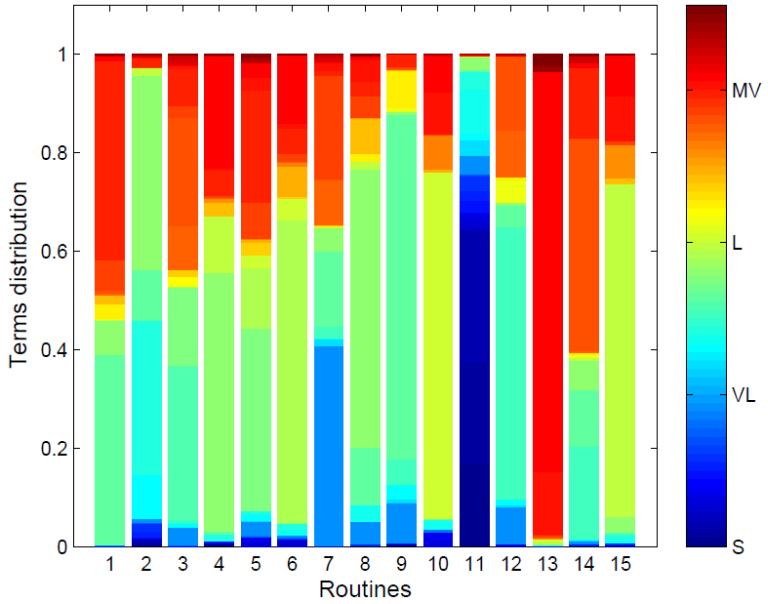

Figure 39 Distribution of the routines over the terms of the vocabulary.

6.5.2 Daily pattern of routines

Figure 40 illustrates the activation probabilities of the extracted routines when day segments of 30 min are sequentially inferred. The inference on sequential day segments provides a qualitative representation of the temporal behaviour of the routines. The top and the bottom plots show the routine patterns for a COPD and a healthy subject, respectively. It can be seen that three PA routines (R2, R11, and R9) pervade the day of a COPD patient (see top plot of Figure 40). In particular, this patient spent most of his time performing activities that involve a L intensity descriptor of short duration, with high μ_{ST}, and low μ_{GSR} and a VL intensity descriptor of long duration, with high μ_{ST} and high μ_{VM}. Three hours after the patient awoke, R9 becomes dominant for about 3 h. This routine includes a L descriptor of short duration, high μ_{ST}, and low μ_{GSR}. The graph also shows that the patient slept in the afternoon for about 1 h (probably he rested after having lunch), and after that he continued with the same behaviour of the morning. After 14 h from the awakening of the subject, R2 starts decreasing and R11, that characterizes the sleeping behaviour, starts to become the most active routine. On the other hand, the day of the healthy subject shows a larger variety of active routine patterns. The bottom plot of Figure 40 shows that the routines R15, R12, R14, R1, R15, R13, and R8 are sequentially active. Around 9 h after his awakening, just before the evening, this subject assumes a behaviour similar to his COPD match, i.e., routine R2 becomes the dominant routine until the sleeping time. From the examples, it can be deduced that this particular day of the COPD patient is more static compared to the one of the healthy subject if the number of transitions between the most active routines is considered. Although we did not use the trajectories of the routines as in Figure 40 in our further analysis they can be used for classification tasks by modelling the trends of routines activation with multitask Gaussian processes [142] or using sequential patterns [143]. In order to extract