Definition of time windows with SaTScan and MST-DBSCAN

In this study we have adopted a posture that allows us to early detect *alive* clusters only. The detection of clusters that emerge all the way to current time is carried out by SaTScan with parameters set to process a prospective Poisson space-time scan analysis considering a window of 2-14 days *in the past*. The analysis is repeated each day in order to gradually monitor the progression of the epidemic.

To complete the results obtained, we used MST-DBSCAN in order to simultaneously assess the transmission behavior of clusters and understand their evolution in time.

SaTScan and MST-DBSCAN work differently. While SaTScan looks backwards in time, i.e. from the date of analysis and considering the 14 previous days, MST-DBSCAN looks for positive cases in the N *following* days. Indeed, in this case a cluster is defined by a core point having a minimum number of 3 neighbors, and then a positive case must appear close to it (<1000m) and *later* (1-7 days) than the core point to be considered a spatio-temporal neighbor.

This difference (7 days temporal window for MST-DBSCAN compared to 14 days temporal window for SaTScan) is due to the fact that we take into account a latency period of ~ 7 days since the gradual onset of the first symptoms for a person to decide to take the steps to get tested for COVID-19. Thus the date of the test we have in the database is approximately in the middle of a period of 14 days (like SaTScan), meaning that we need to consider the 7 next days as input parameter for MST-DBSCAN.