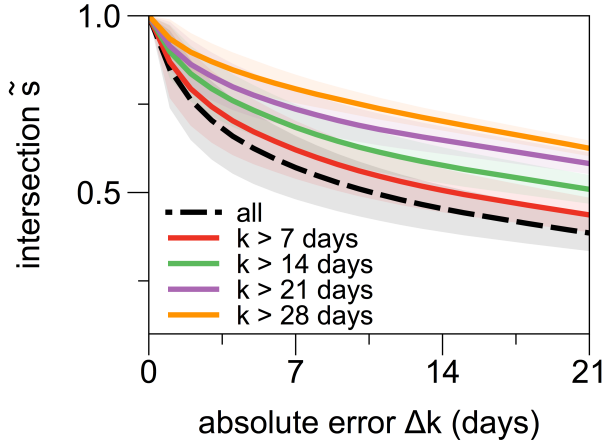


## S1 Additional Investigation of the Dynamic Out-Component

### Intersection of samples for $k \geq k_{min}$

To take into account the high instability in the ranking of nodes for small infectious periods  $k$  we consider creating top samples with a lower bound  $k_{min}$ . To do so we repeat the calculation of the relative intersection  $\tilde{s}$  but average only over  $|k_1 - k_2| \leq \Delta k$  with  $k \geq k_{min}$ . Figure S6 shows the result for a sample size of 0.1% of the network. Any  $k_{min}$  will increase the intersection of the top samples.

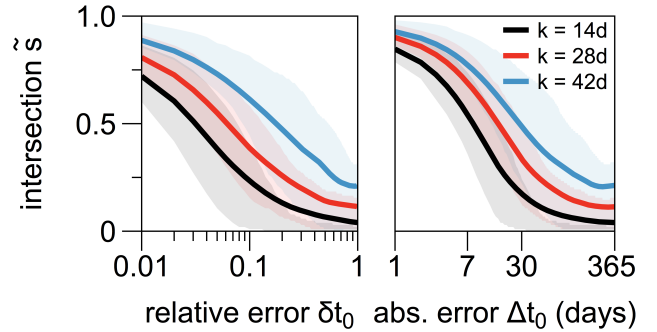


**Figure S5. Intersection of samples for  $k \geq k_{min}$ .**

The mean relative size of the intersection of top samples for a limited range of infectious periods with  $k \geq k_{min}$ . The shaded area represents the confidence interval of each curve respectively.

### Intersection of samples based on different days of primary infection $t_0$

Since the dynamic out-component also depends on the day of the primary infection, it is also useful to investigate its dependence on  $t_0$  for a fixed infectious period  $k = \text{const}$ . The analysis follows the steps of the Results section but instead of averaging over all  $k$  based on a ranking, which itself is already averaged over different  $t_0$ , we calculate the relative intersections  $\tilde{s}$  for different days of primary infection  $t_0$  directly. The infectious period  $k$  is fixed. We obtain Figure S6. The relative size of the intersection significantly drops if two days of primary infection differ by more than a week.



**Figure S6. Intersection of samples based on different days of primary infection  $t_0$ .**

The mean relative size of the intersection for the top 0.1% of all nodes for three different infectious periods  $k$ . The confidence interval of the mean is given by the shaded areas. The left panel shows the intersection of samples as a function of relative error  $|t_{0,1} - t_{0,2}| / \max(t_{0,1}, t_{0,2}) \leq \delta t_0$  and the right panel as a function of the absolute error  $|t_{0,1} - t_{0,2}| \leq \Delta t_0$