individual is less than k.

Kempe et al. [54] have considered the *influence maximization* problem, similar to budgeted vaccination, of finding a size-k subset S of individuals to "infect" with an idea so as to maximize the number of individuals influenced as a result of a "word-of-mouth" diffusion process over a social network. Supposing that the number of influenced individuals is given by an oracle function f, they show that, for a number of diffusion models, the simple greedy algorithm that continually adds to S the individual that maximizes $f(S)$ provides a near-optimal solution. Goyal et al. [48] consider the dual problem of influence maximization, similar to restricted disease, of finding the minimum size set of initial individuals to implant with an idea so that the number of influenced individuals is above a given threshold. They show that, despite its similarity to influence maximization, the problem is quite hard.

There has also been recent work done on game-theoretical aspects of vaccination [7, 26]. Aspnes et al. [7] consider a game-theoretic model of vaccination where individuals can choose to get vaccinated or not. Their main result suggests that, left to their own devices, selfish individuals make decisions that are bad for the whole. Under the assumption that disease spreads in a worst case fashion to all unvaccinated individuals in the contact network, Aspnes et al. [7] introduce the *sum-of-squares partition problem.* Given a graph G of n nodes and budget B, the sum-of-squares partition problem is to find a set of B vertices whose removal from G minimizes the size of the largest connected component. Aspnes et al. [7] show that an $O(\log^{1.5}(n))$-approximation can be achieved in polynomial time.