

Supporting Information

Table S1. Overall syringe sharing reduction and regret scores under for each reasonable access assumption under each scenario.

Overall Needle Sharing Reduction (Enrollment 90% compared to Enrollment 0%) & Regret Scores														
Threshold	Penalty	Max dist threshold		Needle sharing reduction					Best (max)	Regret score				
				Actual	S1	S2	S3			RS_Actual	RS_S1	RS_S2	RS_S3	
1/5	0.6	F	870K	870K	429K	943K	1,013K	1,013K	143K	584K	70K	0K	0K	
1/5	0.6	T	870K	870K	429K	943K	1,016K	1,016K	146K	587K	73K	0K	0K	
1/5	0.75	F	895K	895K	486K	972K	1,043K	1,043K	148K	557K	71K	0K	0K	
1/5	0.75	T	902K	902K	486K	972K	1,034K	1,034K	132K	548K	62K	0K	0K	
1/5	0.9	F	985K	985K	656K	1,036K	1,097K	1,097K	112K	441K	61K	0K	0K	
1/5	0.9	T	980K	980K	656K	1,036K	1,087K	1,087K	107K	431K	51K	0K	0K	
2/10	0.6	F	1,014K	1,014K	713K	1,108K	1,050K	1,050K	94K	395K	0K	58K	58K	
2/10	0.6	T	1,007K	1,007K	713K	1,108K	1,062K	1,062K	1,088K	101K	395K	0K	46K	
2/10	0.75	F	1,016K	1,016K	734K	1,120K	1,063K	1,120K	103K	385K	0K	57K	57K	
2/10	0.75	T	1,020K	1,020K	734K	1,120K	1,063K	1,120K	100K	385K	0K	56K	56K	
2/10	0.9	F	1,050K	1,050K	823K	1,117K	1,078K	1,117K	66K	294K	0K	39K	39K	
2/10	0.9	T	1,045K	1,045K	823K	1,117K	1,076K	1,117K	72K	294K	0K	41K	41K	
5/20	0.6	F	1,059K	1,059K	807K	1,073K	1,042K	1,042K	14K	266K	0K	30K	30K	
5/20	0.6	T	1,061K	1,061K	807K	1,073K	1,044K	1,073K	11K	266K	0K	29K	29K	
5/20	0.75	F	1,062K	1,062K	826K	1,079K	1,052K	1,079K	17K	254K	0K	27K	27K	
5/20	0.75	T	1,071K	1,071K	826K	1,079K	1,047K	1,079K	8K	254K	0K	32K	32K	
5/20	0.9	F	1,065K	1,065K	896K	1,083K	1,060K	1,083K	18K	187K	0K	23K	23K	
5/20	0.9	T	1,072K	1,072K	896K	1,083K	1,053K	1,083K	10K	187K	0K	30K	30K	
75th percentile RS									111K	439K	58K	40K		

Table S1 shows the syringe sharing reduction outcome for each reasonable access assumption under each scenario, along with regret scores. For example, when the ideal geographical travel distance preference is set to be low (i.e., 1 mile for urban and 5 miles for suburban), penalty equals to 0.6, and we do not set a maximum limit, Scenario 3 (Need-based 2) generates the most syringe sharing reduction (1,013K, see first row in Table S1). Accordingly, the regret score for each other scenario is the difference between their syringe sharing reduction result and Scenario 3 (Need-based 2). In this case, Scenario 1 (spatially random) generates the largest regret score, meaning we expect the syringe sharing reduction to be the lowest in this case. In the last row of Table S1, we report the 75th percentile of regret scores across each of the 18 reasonable access assumptions for each scenario, from which we observe that the two *Need-based* scenarios (Scenario 2 and Scenario 3) perform the best. Notably, the *Actual* scenario performs worse than the two *Need-based* scenarios but better than the *Random* scenario.

Table S2. Overall syringe sharing reduction relative risk and regret scores for each reasonable access assumption under each scenario.

Overall Needle Sharing Reduction Relative Risk (Enrollment 90%/Enrollment 0%, zip code weighted by Enrollment 0%)													
exp		Penalty	Threshold	Actual	S1	S2	S3	Best (min)	RS_Actual	RS_S1	RS_S2	RS_S3	
1		0.6	1/5	0.567	0.786	0.530	0.495	0.495	0.071	0.291	0.035	0.000	
2		0.6	2/10	0.495	0.645	0.448	0.477	0.448	0.047	0.197	0.000	0.029	
3		0.6	5/20	0.472	0.598	0.466	0.481	0.466	0.007	0.132	0.000	0.015	
4	No Max	0.75	1/5	0.554	0.758	0.516	0.480	0.480	0.074	0.278	0.035	0.000	
5	Distance	0.75	2/10	0.494	0.634	0.442	0.470	0.442	0.052	0.192	0.000	0.028	
6	Threshold	0.75	5/20	0.471	0.589	0.462	0.476	0.462	0.009	0.126	0.000	0.014	
7		0.9	1/5	0.509	0.673	0.484	0.453	0.453	0.056	0.220	0.030	0.000	
8		0.9	2/10	0.477	0.590	0.444	0.463	0.444	0.033	0.146	0.000	0.019	
9		0.9	5/20	0.469	0.554	0.461	0.472	0.461	0.009	0.093	0.000	0.011	
10		0.6	1/5	0.567	0.786	0.530	0.494	0.494	0.073	0.293	0.036	0.000	
11		0.6	2/10	0.498	0.645	0.448	0.471	0.448	0.050	0.197	0.000	0.023	
12		0.6	5/20	0.471	0.598	0.466	0.480	0.466	0.006	0.132	0.000	0.014	
13	Max 15/60	0.75	1/5	0.550	0.758	0.516	0.485	0.485	0.066	0.273	0.031	0.000	
14	miles	0.75	2/10	0.492	0.634	0.442	0.470	0.442	0.050	0.192	0.000	0.028	
15	Distance	0.75	5/20	0.466	0.589	0.462	0.478	0.462	0.004	0.126	0.000	0.016	
16	Threshold	0.9	1/5	0.512	0.673	0.484	0.459	0.459	0.053	0.215	0.025	0.000	
17		0.9	2/10	0.479	0.590	0.444	0.464	0.444	0.036	0.146	0.000	0.020	
18		0.9	5/20	0.466	0.554	0.461	0.475	0.461	0.005	0.093	0.000	0.015	
								75th percentile RS	0.055	0.219	0.029	0.020	0.020

Note. RS represents regret score.