



## EXECUTIVE SUMMARY (DRAFT VERSION, 12.6.2014)

### The effectiveness of an intervention aiming to reduce street violence: Evaluation of HelsinkiMissio's Aggredi-program

- The aim of Aggredi-program is to reduce violent recidivism among 18–39-year-old offenders convicted or suspected of street violence. On average, the participants of the program have extensive criminal histories.
- The purpose of this study was to assess recidivism in subgroups of Aggredi participants, and to compare levels of recidivism against a comparison group matched by age, sex and criminal background.
- The results are promising for the complier group (those who successfully completed the program): 25% of them were convicted of a violent crime during the follow-up. In contrast, those participants who dropped off the program had a very high level of recidivism, as two thirds of them were convicted of a new violent crime.
- When the levels of recidivism among all those who started in the program were compared with the matched control group, no statistically significant differences were detected. This is due to the high level of recidivism in the noncompliant group.
- The most important limitation of the analysis was that the control group was likely to have a lower probability of re-offending than the treatment group, despite the matching based on criminal history. For this reason, caution is in order when interpreting the results of the matched analysis, and the positive results obtained for the complier group warrant an optimistic interpretation of the results. Thus, as a whole, the results of the evaluation are promising.
- In the future, the effects of crime prevention interventions and programs should be assessed with randomized controlled trials.



## THE ANALYSIS IN A NUTSHELL

- The effect of Aggredi analyzed in three study groups
  - Intention-to-treat [ITT] (n=141) : all individuals who discussed the option of taking part in Aggredi (includes treatment group + complier group)
  - Treatment group (n=97) : those individuals who started in Aggredi (includes complier group)
  - Complier group (n=24) : those individuals who completed Aggredi successfully

Table 1. Means/proportions of pre-treatment covariates in different study groups (intention-to-treat, treatment group, and compliant group)

	ITT group (n=141)	Treatment group (n=97)	Complier group (n=24)
Age at baseline	23,9	24,4	25,2
% men	98%	98%	100%
Violent crimes 3 years prior	3,7	3,7	3,9
All crimes 3 years prior	20,5	20,6	18,5
Days imprisoned three years prior	319	360	384
Imprisoned at the start of the follow-up	45 %	56 %	63 %
Follow-up time (days)	1,060	1,097	998

- The process of searching the suitable controls for the comparison group:
  - For each individual (n=141), the conviction database of NRILP, that includes all convictions in Finland since 1999, was searched to find offenders with similar age (+/- 1 year), sex and conviction history
  - Of the 1,112 controls found at this first stage, those with histories of sexual/domestic violence were dropped, as were those imprisoned for the entire follow-up period
  - To ensure as close match as possible, we used several variables describing criminal history to find a proper control for each individual in the ITT group. Those variables, measured three years prior to treatment start, were 1) the total number of convictions for violence, 2) conviction for aggravated assault, 3) number of unconditional prison sentences, 4) number of days imprisoned, and 5) number of police-reported violent crimes one year before the start of the follow-up. We also matched on a dummy variable indicating whether the individual was serving time in prison at the start of the follow-up
  - We used the Genetic Matching –algorithm in R to conduct the actual matching. This search algorithm seeks to improve the balance between treatment and control groups iteratively, and provides a series of tests to assess the achieved balance and the success of the matching operation. Based on these tests, we ended up using one-to-one nearest neighbor matching with replacement.



## RESULTS – SUBGROUPS OF THE TREATMENT GROUP

- There are important differences in the level of recidivism between different subgroups of Aggredi participants. The recidivism in the complier group is at a much lower level when compared with non-complier groups
- There are also non-significant differences with regards to number of visits, age, type of violence and sending partner. Older individuals and those with a higher number of visits committed less crimes, whereas those typically engaging in impulsive violence recidivated less than those individuals whose violent behavior has an economic goal.

Table 2. Recidivism in the treatment group and its subgroups (One-way ANOVA, p-value in parenthesis)

Variable	Violent crimes			All crimes
	n / year	n / years outside prison	% convicted	n / year
<i>Treatment group (n=97)</i>	0,53	0,80	0,54	4,51
<i>Complier vs. non-complier (NC)</i>				
NC, not reached (n=33)	0,53 (p=0,00)	0,92 (p=0,03)	0,67 (p=0,00)	4,32 (p=0,00)
NC, no motivation (n=33)	0,86	1,16	0,70	7,67
Complier (n=24)	0,20	0,32	0,25	1,41
<i>Number of visits</i>				
1-4 (n=39)	0,59 (p=0,47)	0,96 (p=0,50)	0,64 (p=0,36)	4,20 (p=0,70)
5-9 (n=20)	0,55	0,81	0,55	5,58
10+ (n=26)	0,38	0,59	0,46	4,09
<i>Age</i>				
18-23 (n=50)	0,59 (p=0,59)	0,85 (p=0,65)	0,58 (p=0,34)	5,24 (p=0,40)
24-29 (n=33)	0,50	0,87	0,55	4,26
30-36 (n=14)	0,35	0,53	0,36	2,51
<i>Type of violence</i>				
Impulsive violence (n=39)	0,37 (p=0,04)	0,53 (p=0,04)	0,44 (p=0,14)	2,43 (p=0,00)
Violence for economic gain (n=45)	0,71	1,07	0,60	6,49
<i>Sending partner</i>				
Prison (n=42)	0,61 (p=0,35)	0,89 (p=0,43)	0,47 (p=0,20)	6,00 (p=0,13)
Community sanctions office (n=35)	0,54	0,88	0,68	3,89
Other (n=20)	0,32	0,50	0,45	2,49



## RESULTS – RECIDIVISM IN STUDY GROUPS AND COMPARISON GROUPS

- When recidivism rates are compared in ITT and treatment groups with their respective control groups, no significant differences emerge. The rates of recidivism are slightly higher in the study groups.
- When only compliers are analyzed, their levels are lower when compared to their controls, but this difference is also non-significant

Table 3. Recidivism rates in study groups vs. control groups (Average treatment effect on the treated, p-value)

	Violent crimes			All crimes
	n / year	n / years outside prison	% convicted	n / year
ITT vs. controls (n=141)	+0,08 (p=0,32)	+0,10 (p=0,42)	+0,05 (p=0,34)	+0,86 (p=0,29)
Treatment groups vs. controls (n=97)	+0,13 (p=0,20)	+0,07 (p=0,69)	+0,11 (p=0,15)	+0,94 (p=0,28)
Compliers vs. controls (n=24)	-0,20 (p=0,17)	-0,47 (p=0,11)	-0,11 (p=0,32)	-1,81 (p=0,07)

### METHODOLOGICAL CONCERNS

- The matched estimates of treatment effects are reliable estimates of causal impact of the program only if the treatment and control groups are on average similar on all observed and unobserved characteristics of the individuals at the baseline.
- We cannot be sure that matching on observed criminal history sufficiently balances the two groups with respect to baseline unobserved criminal/violent propensity – it is possible that crime in Helsinki metropolitan area differs from crime in the rest of the country, and some of the offenders in Aggredi program are involved in types of crime (e.g. organized crime) not present in similar extent elsewhere.
- Robustness checks indicate that even untreated individuals who had hardly any contact with Aggredi also recidivate more than their controls. In this case, it seems more plausible that the matching procedure failed to find controls with a probability of violence as high as in the treatment group.
- On the other hand, the positive results for compliers could be related to motivational factors, that might explain differences between compliers and non-compliers, and differences between compliers and their controls
- For these reasons, a randomized controlled trial with intention-to-treat analysis would be the best way to find out the causal impact of Aggredi on later offending, as matching methods leave too many questions open, particularly in a treatment evaluation where self-selection and motivation play an important role in program participation



## CONCLUSION

- To an extent, the effectiveness of Aggredi remains a matter of judgment, and the outcome of evaluation depends on which result one wishes to stress: the positive result obtained for the compliers, or the null result obtained in the analysis using matched controls.
- Given that the results for the compliers are as strong as they are, our assessment is that as a whole the results of the evaluation are encouraging for Aggredi.
- In the future, the main challenge of the program is to find ways to decrease non-compliance rates. It might be wise to concentrate the efforts of finding new participants to those individuals being released from prison, as they seem to do better in the program (in terms of compliance) than customers from elsewhere.
- In the future, such evaluations would clearly benefit from RCT's.