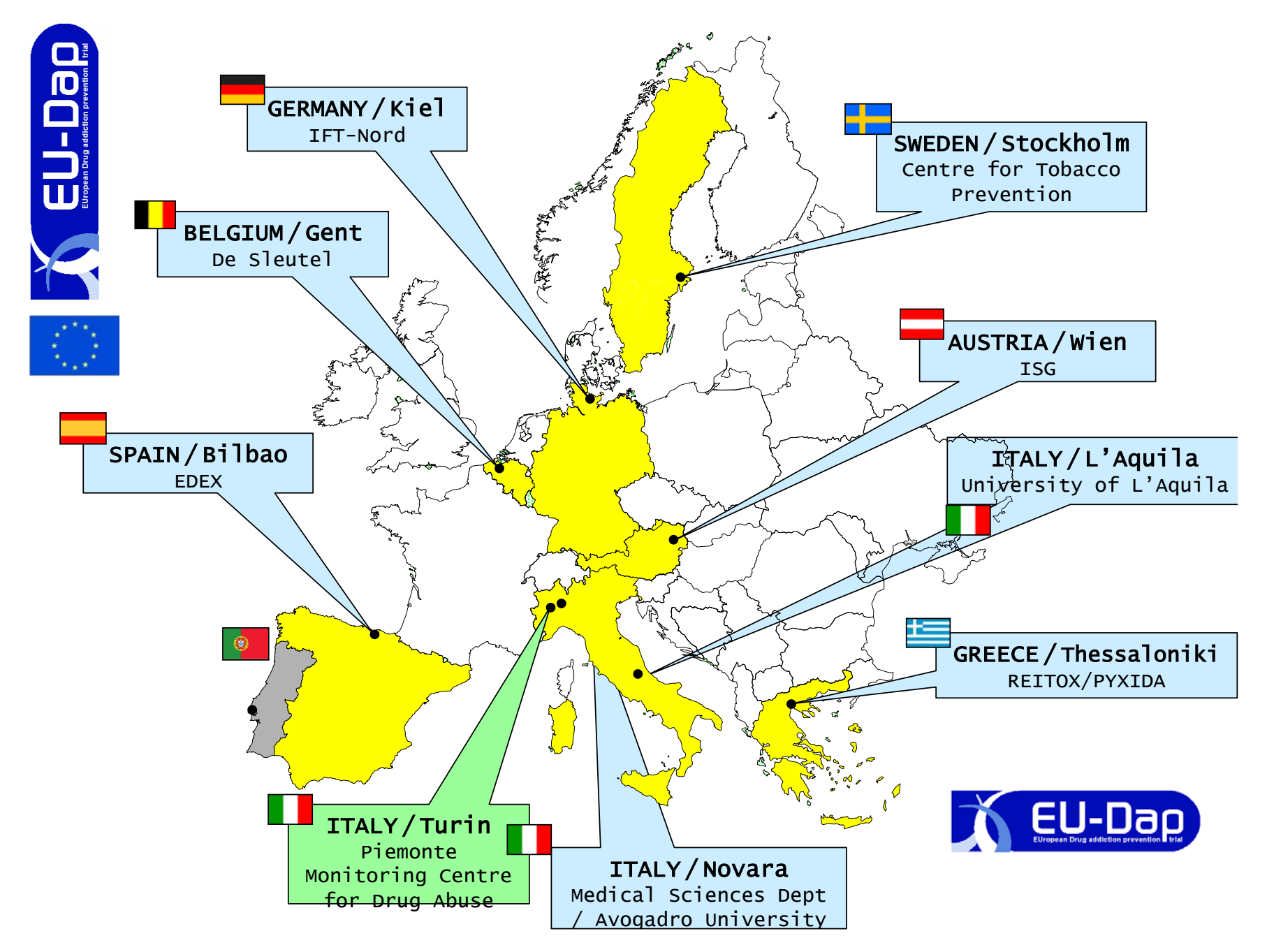
EU-Dap project: preliminary results on smoking, alcohol and drugs use

Fabrizio Faggiano
OED-Piemonte and
Avogadro University


EU-Dap
EUropean Drug addiction prevention trial
GERMANY / Kiel
IFT-Nord
SWEDEN / Stockholm
Centre for Tobacco Prevention
BELGIUM / Gent
De Sleutel
AUSTRIA / Wien
ISG
SPAIN / Bilbao
EDEX
ITALY / L'Aquila
University of L'Aquila
GREECE / Thessaloniki
REITOX/PYXIDA
ITALY / Turin
Piemonte Monitoring Centre for Drug Abuse
ITALY / Novara
Medical Sciences Dept / Avogadro University
EU-Dap
EUropean Drug addiction prevention trial

Enrollment

- 7079 students were enrolled at the ***baseline survey*** (November 2004)
- After the questionnaire submission and before February 2005 the program were administred
- 6604 participated to the ***follow-up survey*** (May 2005), at least 3 months after the completion of the program

From study population to analysis sample

BASELINE

CENTER	STUDY POPULATION ANALYSIS DATA [ADP0012]
	N=QUEST
[01] Italy/Turin	1660
[02] Spain/Bilbao	429
[03] Germany/Kiel	592
[04] Belgium/Gent	709
[05] Sweden/Stockholm	1033
[06] Greece/Thessaloniki	732
[07] Austria/Wien	858
[08] Italy/Novara	516
[09] Italy/Aquila	550
TOTAL	**7079**

FIRST FOLLOWUP

CENTER	STUDY POPULATION ANALYSIS DATA [ADP0012]
	N=QUEST
[01] Italy/Turin	1529
[02] Spain/Bilbao	393
[03] Germany/Kiel	591
[04] Belgium/Gent	703
[05] Sweden/Stockholm	959
[06] Greece/Thessaloniki	691
[07] Austria/Wien	733
[08] Italy/Novara	491
[09] Italy/Aquila	514
TOTAL	**6604**

CENTER	ANALYTICAL SAMPLE MATCHED ANALYSIS DATA [ADP0022]	% MATCHED [ADP0022] / [CANDIDATE]
	N=QUEST	%
[01] Italy/Turin	1493	89,9
[02] Spain/Bilbao	371	92,3
[03] Germany/Kiel	561	94,8
[04] Belgium/Gent	635	89,6
[05] Sweden/Stockholm	927	91,4
[06] Greece/Thessaloniki	690	94,3
[07] Austria/Wien	716	91,2
[08] Italy/Novara	479	92,8
[09] Italy/Aquila	498	90,5
TOTAL	**6370**	**91,5**

% MATCHED [ADP0022] / [CANDIDATE]
%
97,6
94,4
94,9
90,3
96,7
99,9
97,7
97,6
96,9
96,5

Baseline-followup matching

- 6960 out of 7079 baseline questionnaires were elegible for matching as they were present at follow-up
- 6370 out of 6960 (91.5%) baseline questionnaires matched to the corresponding follow-up questionnaire
  - the matching procedure was based on the anonymous code
  - it started using all the 9 digits, and followed limiting to 6 codes
  - the last step was a manual linkage, carried independently by 2 researchers, at the level of class

Baseline prevalence of use in last 30 days by gender

		Boy (N=3680)	Girl (N=3288)	Total (N=7079)
ALO smoked cigarettes	%	14.2	16.9	15.5
	N	497	537	1034
ALO drunkenness	%	7.3	6.0	6.7
	N	260	194	454
ALO smoked cannabis	%	4.7	2.8	3.8
	N	169	92	261
ALO drugs use	%	6.1	4.6	5.4
	N	223	150	373

Baseline prevalence of use in last 30 days by age

		12 Yrs (N=2299)	13 Yrs (N=2175)	14 Yrs (N=2605)	Total (N=7079)
ALO smoked cigarettes	**%**	**6.9**	**8.5**	**28.8**	**15.5**
	N	**153**	**176**	**719**	**1048**
ALO drunkenness	**%**	**3.9**	**3.8**	**11.6**	**6.7**
	N	88	81	295	464
ALO smoked cannabis	**%**	**1.3**	**1.0**	**8.4**	**3.8**
	N	30	21	217	268
ALO drugs use	**%**	**3.3**	**1.8**	**10.3**	**5.4**
	N	76	39	267	382

Effect of the parent's smoking on children's behaviour

		Parents Not Smoking (N=3042)	One Parent Smoking (N=2396)	Both Parents Smoking (N=1554)	Siblings Not Smoking (N=4847)	Siblings Smoking (N=1276)	Total (N=7079)
ALO smoked cigarettes	**%**	**28.3**	**38.2**	**43.1**	**28.0**	**59.1**	**35.0**
	N	857	910	663	1348	744	2442

Effect of the parent's permission to smoke or to be drunk

		Would allow	Wouldn't allow	Don't know	Total
		(N=1091)	(N=5169)	(N=690)	(N=7079)
ALO smoked cigarettes	%	**61.0**	**29.3**	**36.8**	**35.1**
	N	663	1506	251	2420
		(N=1463)	(N=4108)	(N=1334)	(N=7079)
ALO drunkenness	%	**43.8**	**16.6**	**26.0**	**24.2**
	N	640	680	345	1665

Baseline inbalance

		Study arm					Total (n=7079)	
		Basic (n=1190)	**Parents (n=1164)**	**Peers (n=1193)**	**Intervention (n=3547)**	**Control (n=3532)**		
		%	**%**	**%**	**%**	**%**	**N**	**%**
Smoking		34.4	31.8	35.4	33.9	35.9	2469	34.9
	*p-value vs control**	*1.00*	*0.032*	*1.00*	*0.072*			
Been drunk		21.6	22.9	25.8	23.5	24.7	1704	24.1
	*p-value vs control**	*0.09*	*0.68*	*1.00*	*0.23*			
Used cannabis		7.7	7.0	8.1	7.6	8.9	583	8.
	*p-value vs control**	*0.65*	*0.12*	*1.00*	*0.046*			

the control group appears to have higher prevalence in substance use when compared to intervention groups

Description of the analysis sample

Characteritics of the analysis sample

	Study Arm					
	Controls (N=3297)		All interventions (N=3307)		Total population (N=6604)	
	n	%	n	%	n	%
Gender						
boys	1629	51.3	1695	53.0	3324	52.2
girls	1538	48.5	1497	46.8	3035	47.6
missing	7	0.2	4	0.1	11	0.2
Age						
12 years	1043	32.9	998	31.2	2041	32.0
13 years	851	26.8	1135	35.5	1986	31.2
14 years	1280	40.3	1063	33.3	2343	36.8

Characteritics of the analysis sample

	Study Arm					
	Controls (N=3297)		All interventions (N=3307)		Total population (N=6604)	
	n	%	n	%	n	%
School Grade						
7th level	1469	46.3	1499	46.9	2968	46.6
8th level	425	13.4	634	19.8	1059	16.6
9th level	1280	40.3	1063	33.3	2343	36.8

Characteritics of the analysis sample

	Study Arm					
	Controls (N=3297)		All interventions (N=3307)		Total population (N=6604)	
	n	%	n	%	n	%
Centres						
Italy - Turin	859	27.1	634	19.8	1493	23.4
Spain - Bilbao	212	6.7	159	5.0	371	5.8
Germany - Kiel	203	6.4	358	11.2	561	8.8
Belgium - Gent	288	9.1	347	10.9	635	10.0
Sweden - Stockholm	426	13.4	501	15.7	927	14.5
Greece - Thessaloniki	322	10.1	368	11.5	690	10.8
Austria - Wien	433	13.6	283	8.8	716	11.2
Italy - Novara	209	6.6	270	8.4	479	7.5
Italy - Aquila	222	7.0	276	8.6	498	7.8

Effect measures: possible choices

- ***Prevalence*** (those who use substances in the follow-up survey)
- ***Incidence*** (those who used at the follow-up survey among those who did not use at the baseline survey)
- ***Cessation*** (those who did not use at the follow-up survey among those who used at the baseline survey)

Effect measures: differences

- ***Prevalence:*** do not take into account baseline prevalence, it includes all the sample, is more used, and easier to understand
- ***Incidence*** is "naturally adjusted" by the baseline prevalence, it excludes the users, is less used
- ***Cessation*** meaningless in adolescence, consider those non considered by the incidence

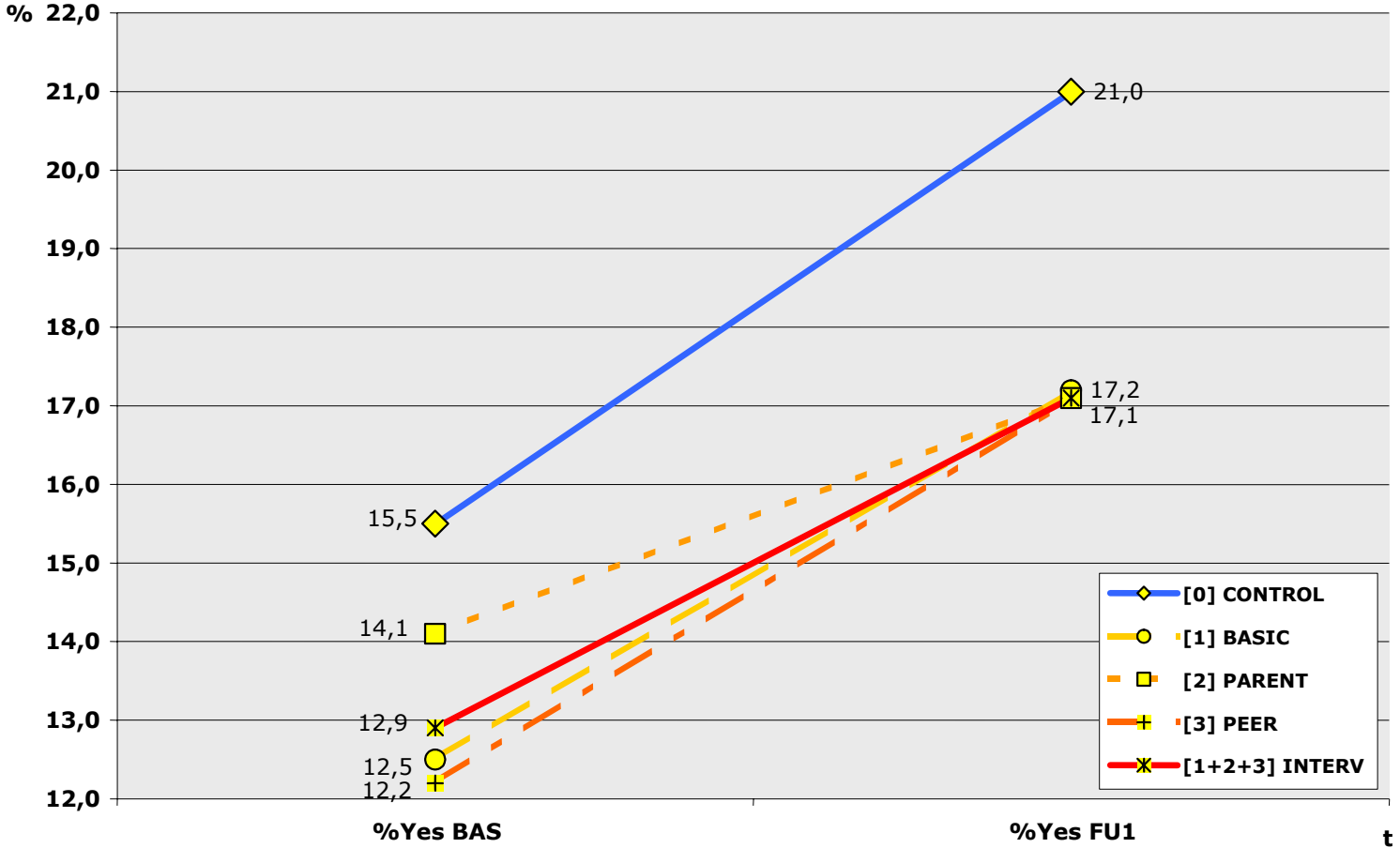
Effect measures: decision

- Because of the baseline imbalance, the prevalence at the follow-up cannot be use without adjustment
- We decide to use ***Prevalence*** controlling the baseline imbalance through the regression model
- ***Incidence*** will be used as a complementary indicator

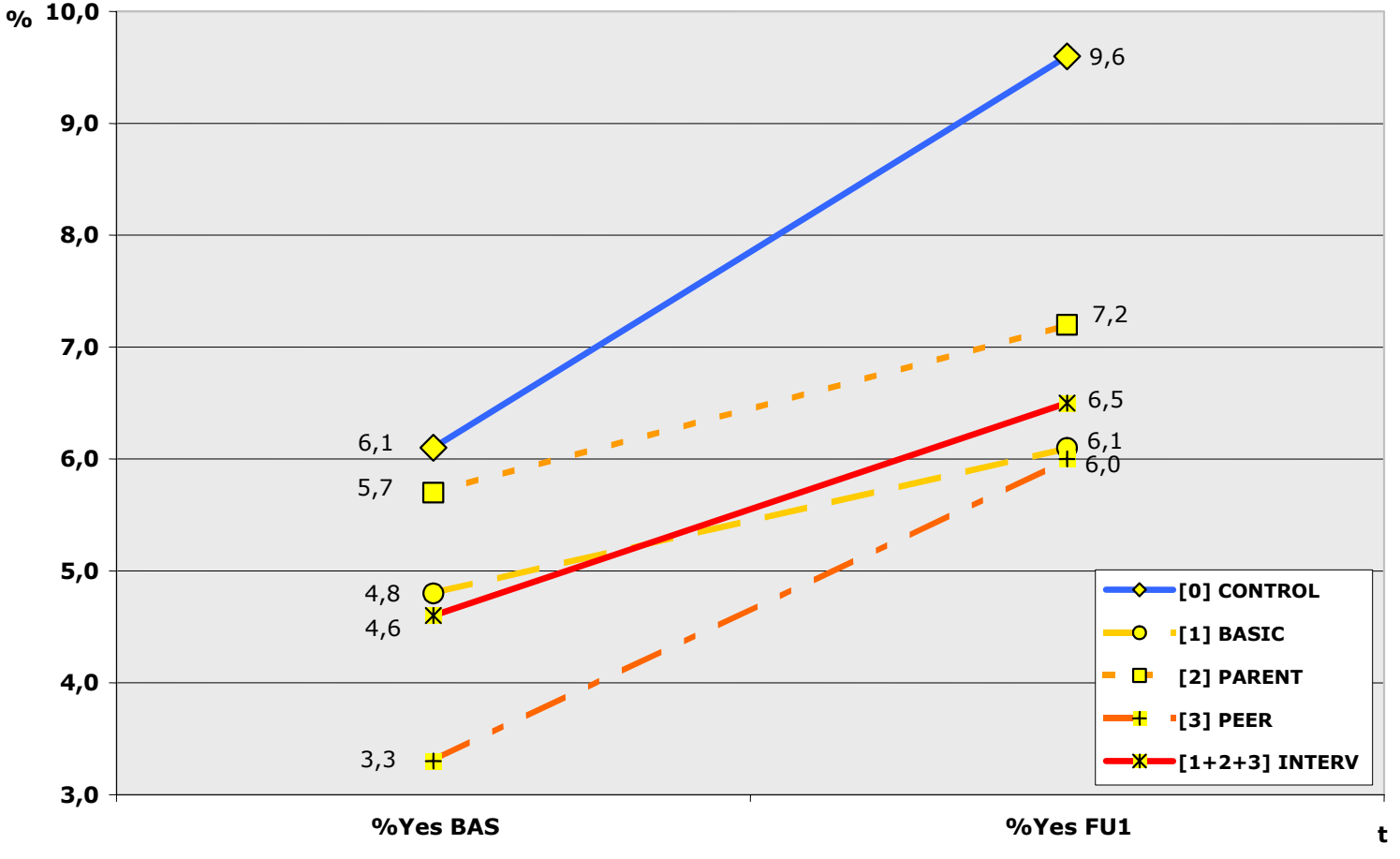
Outcomes measures

1. ***ALO smoking***= at least one sigarette in last 30 days
2. ***Regular Smoking***=at least 6 times in last 30d
3. ***Daily smoking***= at least 20 times in last 30d
4. ***ALO drukenness***= at least once in last 30d
5. ***Regular drunkeness***=at least 3 times in last 30d
6. ***ALO cannabis***= at least once in last 30d
7. ***Regular cannabis***= at least 3 times in last 30d
8. ***ALO drugs***=at least once of any illicit drug in last 30d

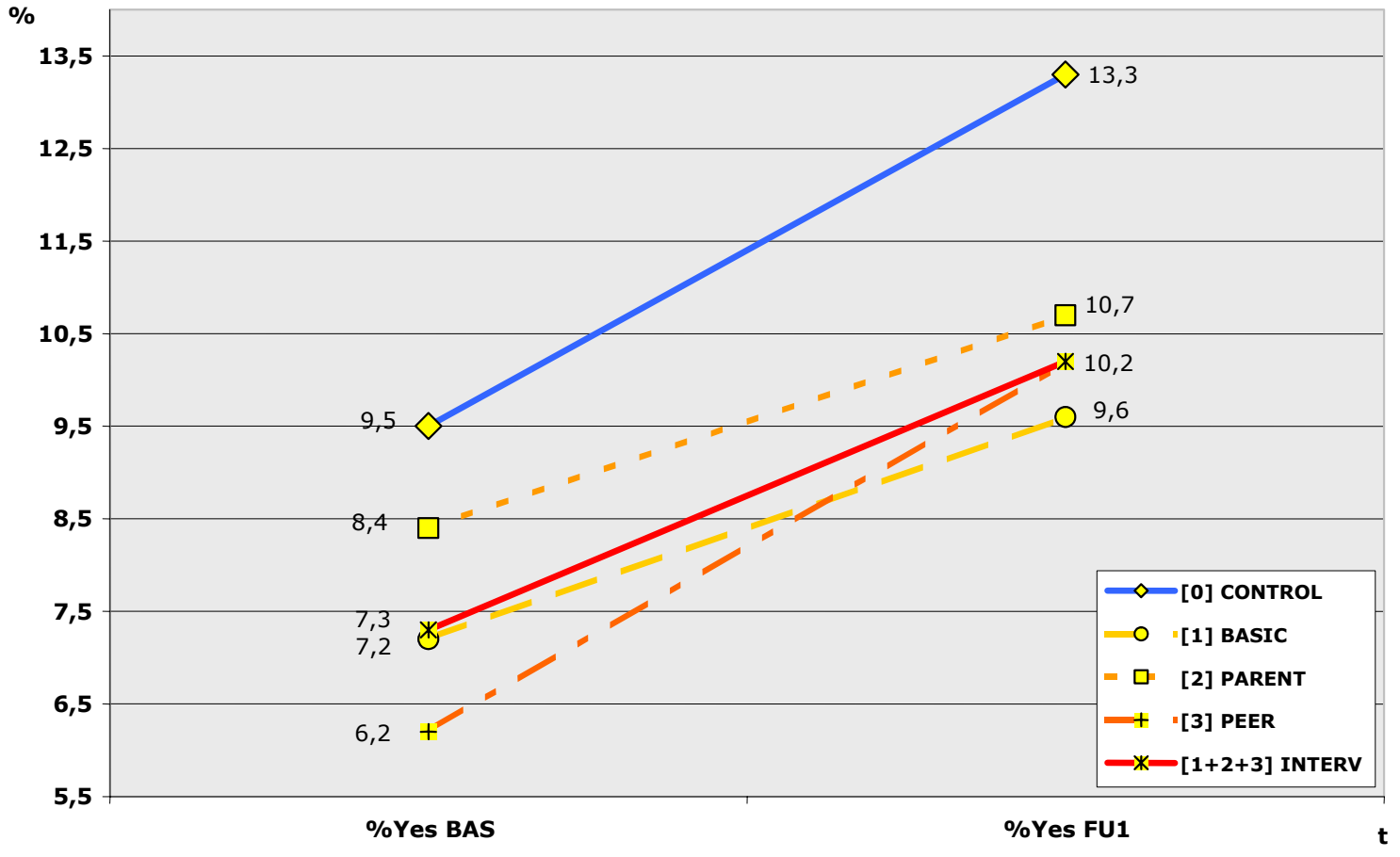
Changes in prevalence of smoking
(ALO in last 30 days)



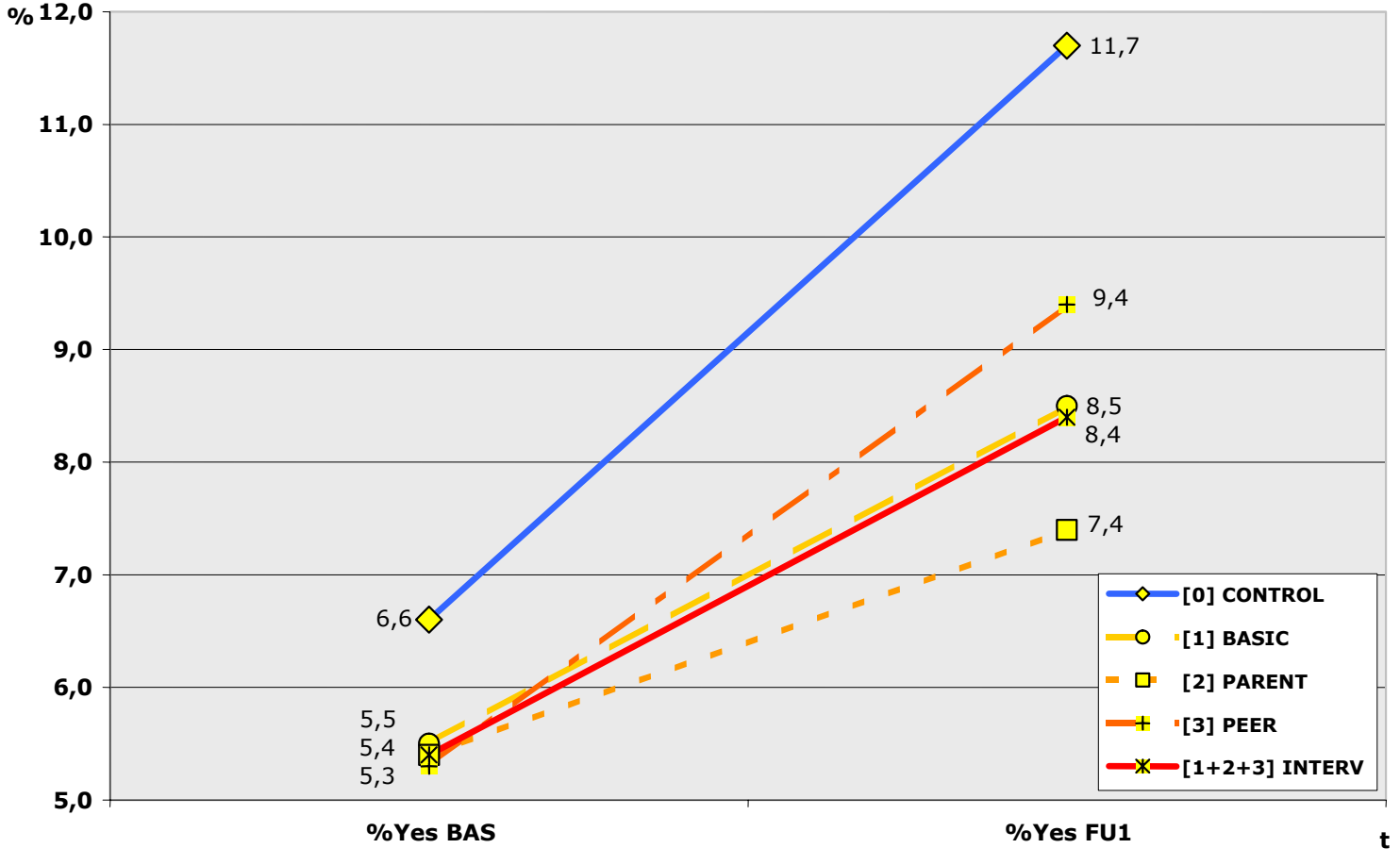
Changes in prevalence of smoking
(daily smoking in last 30 days)



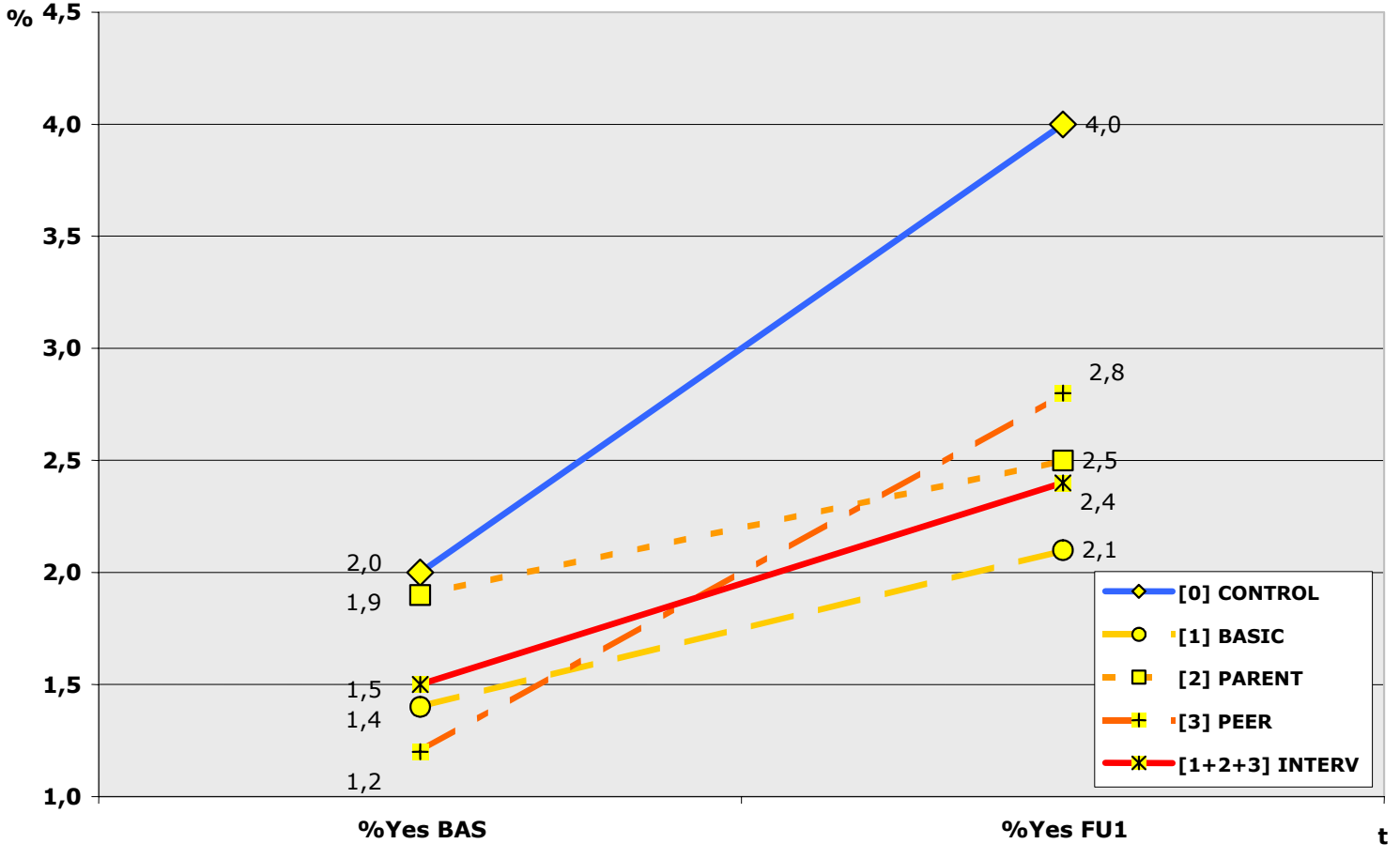
Changes in prevalence of smoking
(regular smoking in last 30 days)



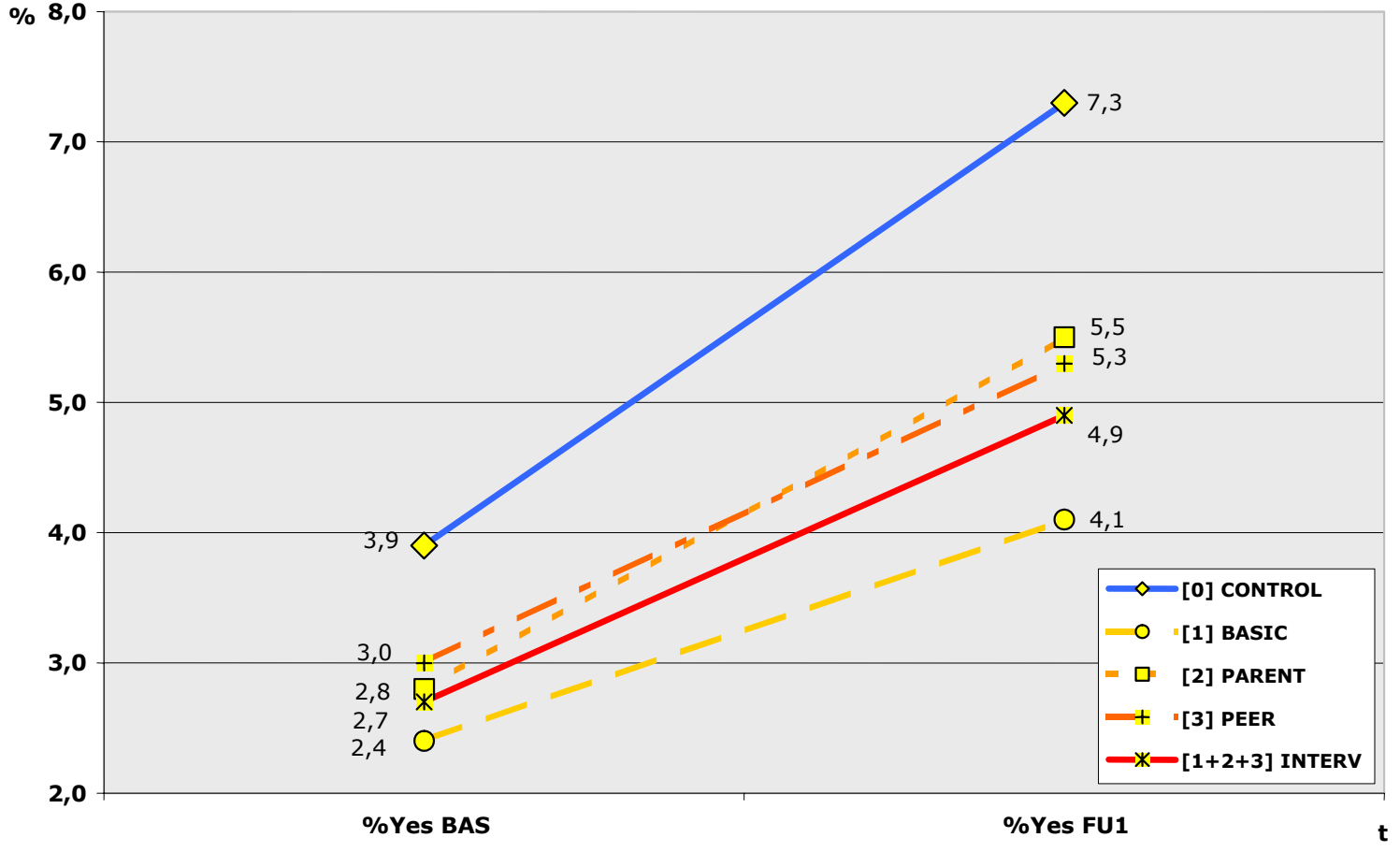
Changes in prevalence of drunkenness
(ALO in last 30 days)



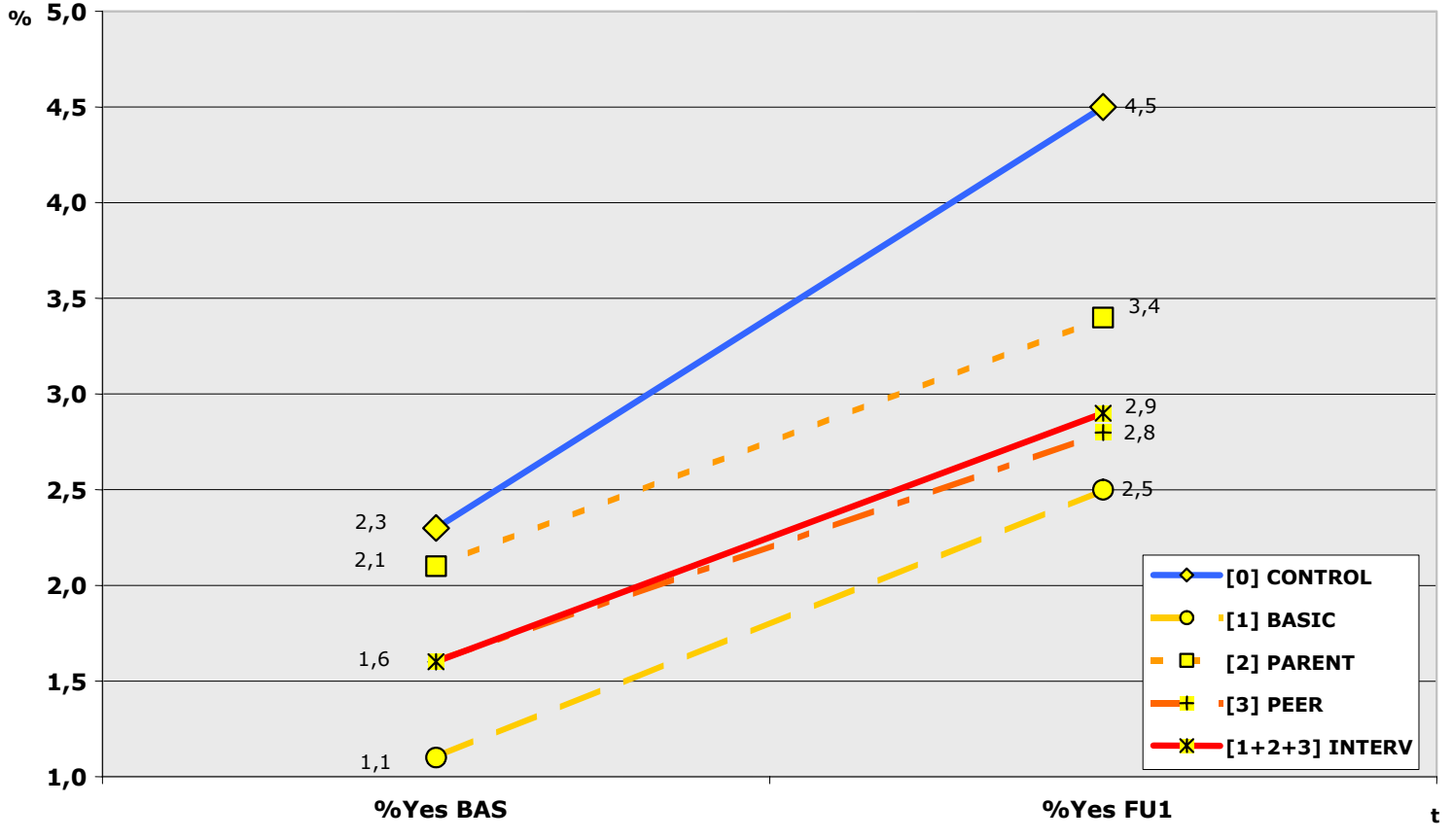
Changes in prevalence of drunkenness
(regular drunkenness in last 30 days)



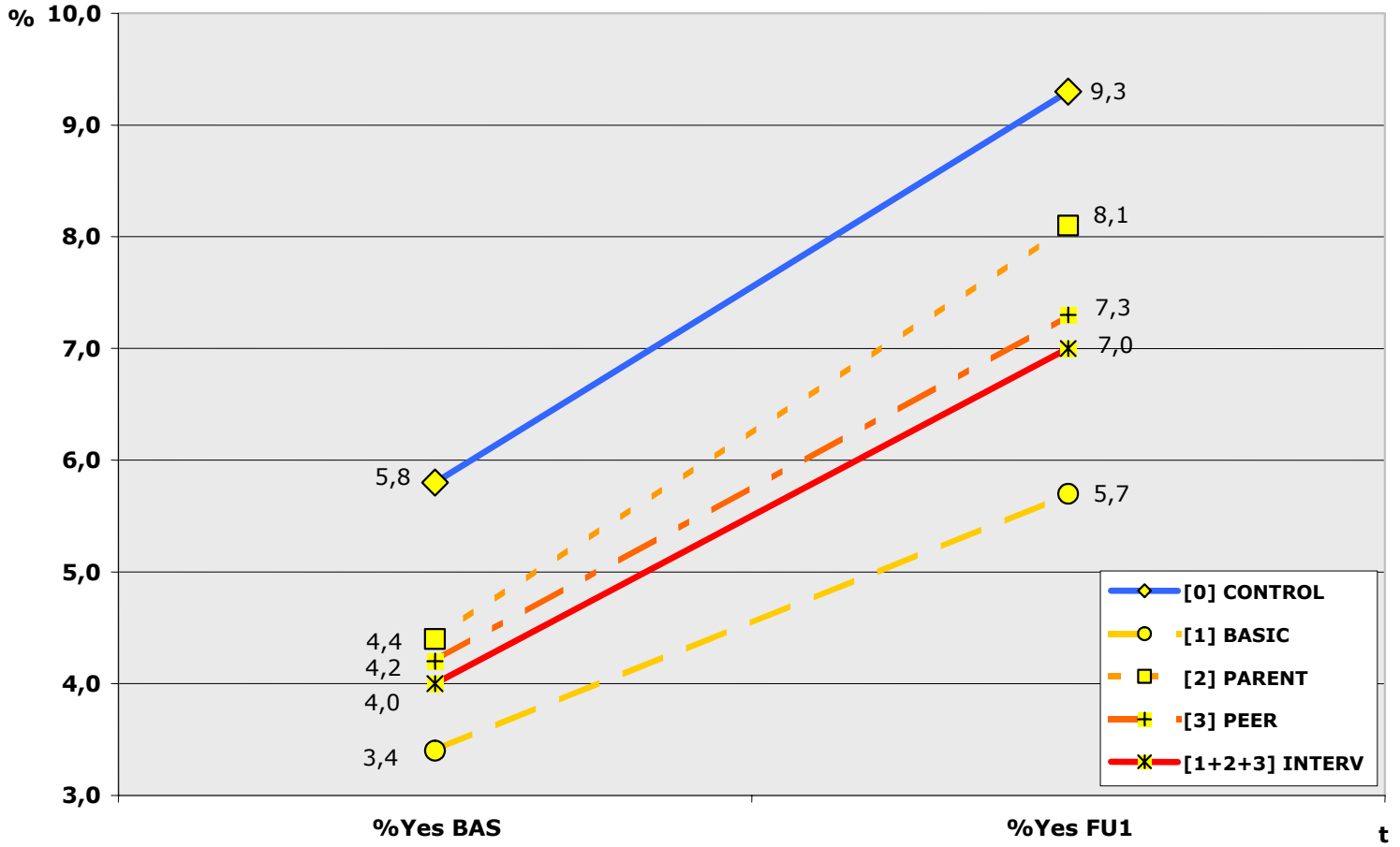
Changes in prevalence of use of cannabis
(ALO in last 30 days)



Changes in prevalence of use of cannabis
(regular use in last 30 days)



Changes in prevalence of use of drugs
(ALO in last 30 days)



Some preliminary considerations

- There are small (and statistically non significant) differences among the study arms
- Even if the ***basic intervention*** appears to work better
- For power considerations, the following analysis will be done grouping together interventions

Prevalence of use (not adjusted for the cluster effect)

	Controls				All interventions						
	All subjects	users F-U	Prev	PR	all subjects	users F-U	Prev	PR	95%CI	p	APR
ALO smoked cigarettes	3059	642	0.210	1	3098	531	0.171	0.82	0.74-0.91	<0.0005	0.03
Daily use	3059	294	0.096	1	3098	200	0.065	0.67	0.57-0.80	<0.0005	0.04
Regular use	3059	407	0.133	1	3098	315	0.102	0.76	0.67-0.88	<0.0005	0.03
ALO drunkenness	3112	363	0.117	1	3145	265	0.084	0.72	0.62-0.84	<0.0005	0.03
Regular	3112	123	0.040	1	3145	77	0.024	0.62	0.47-0.82	<0.005	0.02
ALO smoked cannabis	3157	230	0.073	1	3179	157	0.049	0.68	0.56-0.83	<0.0005	0.02
Regular use	3157	141	0.045	1	3179	92	0.029	0.65	0.50-0.84	<0.005	0.02
All drugs use	3171	294	0.093	1	3191	224	0.070	0.76	0.64-0.89	<0.005	0.02

Incidence of use
(not adjusted for the cluster effect)

	Control				All interventions						
	not users BAS	new users F-U	Inc	RR	not users BAS	new users F-U	Inc	RR	95%CI	p	AIR
ALO smoked cigarettes	2516	247	0.098	1	2597	224	0.086	0.88	0.74-1.04	NS	0.01
Daily use	2786	128	0.046	1	2842	76	0.027	0.58	0.44-0.77	<0.001	0.02
Regular use	2687	158	0.059	1	2766	126	0.046	0.77	0.62-0.97	<0.05	0.01
ALO drunkenness	2857	233	0.082	1	2920	174	0.060	0.73	0.60-0.88	<0.005	0.02
Regular	2995	90	0.030	1	3038	58	0.019	0.64	0.46-0.88	<0.01	0.01
ALO smoked cannabis	3008	132	0.044	1	3066	93	0.030	0.69	0.53-0.90	<0.01	0.01
Regular use	3061	81	0.026	1	3101	57	0.018	0.69	0.50-0.97	<0.05	0.01
All drugs use	2972	181	0.061	1	3059	151	0.049	0.81	0.66-1.00	<0.05	0.01

Adjusted analysis

- There are 2 major reasons for adjustment:

1. The control for the ***cluster effect*** (to correct the ***inflated precision*** due to the lower ***intraclass variability***)
2. To correct for the ***imbalance in the baseline characteristics*** (controls have higher prevalences)

Adjusted analysis

- The ***Multilevel Regression Model*** (called also Random Effect Model) is considered the best model for the analysis of ***Cluster RCTs***, and allows for the control of imbalance too
- We decided to use ***Daily smoking*** (as fixed effect) to control for imbalance, because it appears to be a more stable variable

Adjusted analysis

- The major problem in looking for the best model has been the ***instability***, due to the low prevalence and to its variability across centers
- For this reason, as well as for efficiency consideration (and for parsimony), the number of levels has to be as low as possible
- The theoretical levels are 4 (centre, school, class and student) but schools and classes are highly correlated
- Then the model chosen is the following:
  - ***Centre, class and student*** as levels
  - Daily smoking in the centre level

Multilevel analysis

Regression model with 3 levels (center class student)
prevalence of daily smoking at the level of centre
as fixed effect

outcome	all		
	N ctrl	N int	OR (95%CI)
ALO smoking	642/3059	531/3098	0.88 (0.71-1.08)
Regular smoking	407/3059	315/3098	0.85 (0.65-1.10)
Daily smoking	294/3059	200/3098	**0.74 (0.55-0.99)**
ALO drunkenness	363/3112	265/3145	**0.74 (0.60-0.92)**
Regular drunkenness	123/3112	77/3145	**0.65 (0.46-0.92)**
ALO cannabis	230/3157	157/3179	**0.77 (0.61-0.98)**
Regular cannabis	141/3157	92/3179	0.77 (0.57-1.03)
ALO drugs	294/3171	224/3191	0.85 (0.67-1.09)

Multilevel analysis

Regression model with 3 levels (center class student)
prevalence of daily smoking at the level of centre
as fixed effect

outcome	males			females		
	N cntr	N int	OR (95%CI)	N cntr	N int	OR (95%CI)
ALO smoking	327/1566	236/1634	0.77 (0.60-1.00)	314/1487	295/1460	0.97 (0.73-1.30)
regular smoking	222/1566	133/1634	**0.65 (0.48-0.87)**	184/1487	182/1460	0.93 (0.64-1.36)
daily smoking	167/1566	83/1634	**0.56 (0.40-0.78)**	126/1487	117/1460	0.89 (0.58-1.36)
ALO drunkenness	214/1588	145/1661	**0.69 (0.53-0.90)**	148/1519	120/1480	0.83 (0.62-1.11)
regular drunkenness	83/1588	51/1661	**0.66 (0.44-0.98)**	39/1519	26/1480	0.66 (0.39-1.12)
ALO cannabis	165/1617	91/1686	**0.59 (0.45-0.79)**	64/1534	66/1489	0.91 (0.65-1.28)
regular cannabis	109/1617	56/1686	**0.57 (0.40-0.80)**	31/1534	36/1489	0.78 (0.47-1.31)
ALO drugs	195/1627	116/1691	**0.63 (0.48-0.83)**	97/1537	108/1496	0.77 (0.55-1.09)

Multilevel analysis

Regression model with 3 levels (center class individual) prevalence of daily smoking at the level of centre as fixed effect

outcomes	12 years			13 years			14 years		
	n/N ctrl	n/N int	OR (95%CI)	n/N ctrl	n/N int	OR (95%CI)	n/N ctrl	n/N int	OR (95%CI)
ALO smoking	102/ 1002	76/ 960	0.88 (0.68-1.15)	101/ 815	137/ 1098	0.99 (0.62-1.58)	439/ 1242	318/ 1040	0.81 (0.64-1.02)
Regular smoking	65/ 1002	45/ 960	0.78 (0.43-1.42)	51/ 815	71/ 1098	0.94 (0.49-1.82)	291/ 1242	199/ 1040	0.79 (0.60-1.03)
Daily smoking	43/ 1002	29/ 960	0.53 (0.21-1.32)	38/ 815	43/ 1098	0.66 (0.30-1.44)	213/ 1242	128/ 1040	**0.68 (0.51-0.92)**
ALO drunkenness	74/ 1023	58/ 977	0.73 (0.39-1.37)	65/ 835	85/ 1116	0.95 (0.64-1.42)	224/ 1254	122/ 1052	**0.60 (0.45-0.80)**
Regular drunkenness	26/ 1023	18/ 977	0.61 (0.26-1.44)	17/ 835	22/ 1116	0.90 (0.44-1.86)	80/ 1254	37/ 1052	**0.52 (0.32-0.83)**
ALO cannabis	23/ 1040	17/ 995	0.65 (0.27-1.62)	18/ 846	24/ 1128	0.96 (0.49-1.91)	189/ 1271	116/ 1056	**0.73 (0.55-0.97)**
Regular cannabis	12/ 1040	10/ 995	0.70 (0.19-2.53)	8/ 846	15/ 1128	0.79 (0.31-1.99)	121/ 1271	67/ 1056	**0.68 (0.49-0.94)**
ALO drugs	47/ 1043	41/ 998	0.80 (0.44-1.43)	27 /850	38/ 1135	0.94 (0.52-1.72)	220/ 1278	145/ 1058	0.79 (0.60-1.05)

Discussion of results

- ***Unplugged*** seems to work, a least in a short term
- it seems to work better:
  - for alcohol and cannabis than for smoking
  - for higher frequent use than for sporadic users
  - for boys than for girls
- the observation of differences on age are meaningless because they could be explained by the complete correlation with centers

Critical points

- there are big ***differences between centers*** (data not shown) that need to be explained, mainly by differences in the implementation of the program
- the ***lack of effect*** of any extra intervention (***parents, peers***) have to be explained, yet
- the follow-up at 1 year will give data to test the stability over time of the results

Conclusions

- conducting a big RCT across 9 centres, in 7 countries, involving 10 languages (including English) is a hard enterprise
- do it assuring high level of methologic rigour is even harder
- but it has been possible
- thanks to the deep degree of involvement and collaboration of all the members of the EU-Dap group, and especially to the support of Gregor Gurkhart and of the EMCDDA