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Alcohol Use and Psychiatric Comorbidity: A Phenotypic perspective

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Objectives

- **To establish homogeneous alcohol user classes based on comorbidities using latent class analysis.**
- **To validate latent phenotypic classes using external covariates.**
- **To find similarity between latent phenotypic classes using multi dimensional scaling.**

Data Source

- **National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), 2000-2001.**
- **43,093 non-institutionalized household residents**
- **aged ≥ 18 years**
- **NIAAA Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV Version (AUDADIS-IV)**

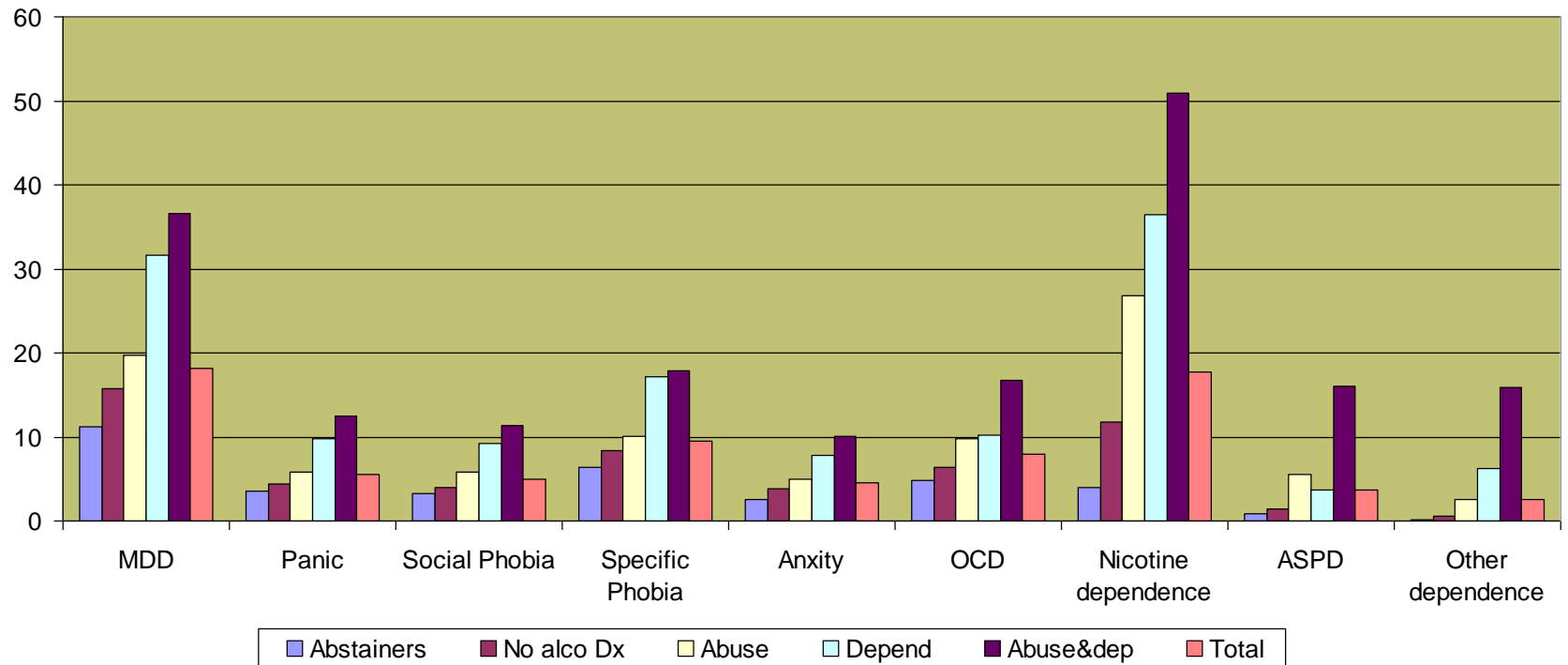
Methods* I

- **NESARC data were divided in to five discrete groups**
 - **Abstainers**
 - **No alcohol diagnosis**
 - **Abuse only**
 - **Dependence only**
 - **Abuse and dependence only**
- **Used the following 9 comorbid diagnosis to determine latent structure of each of the above groups**
 - **Major Depressive Disorder**
 - **Panic Disorder and Agoraphobia**
 - **Social Phobia**
 - **Specific Phobia**
 - **Generalized Anxiety Disorder**
 - **Obsessive Compulsive Disorder**
 - **Antisocial Personality Disorder**
 - **Nicotine dependence**
 - **Other drug dependence**

Methods II

- **External validators**
 - Gender
 - Age
 - Education
 - Ethnicity
 - Mental health scale
 - Physical function scale*
 - Family history of alcohol problem
 - Age at onset of alcohol use*
 - Age at onset of everyday smoking

Prevalence of co-morbidities in each group



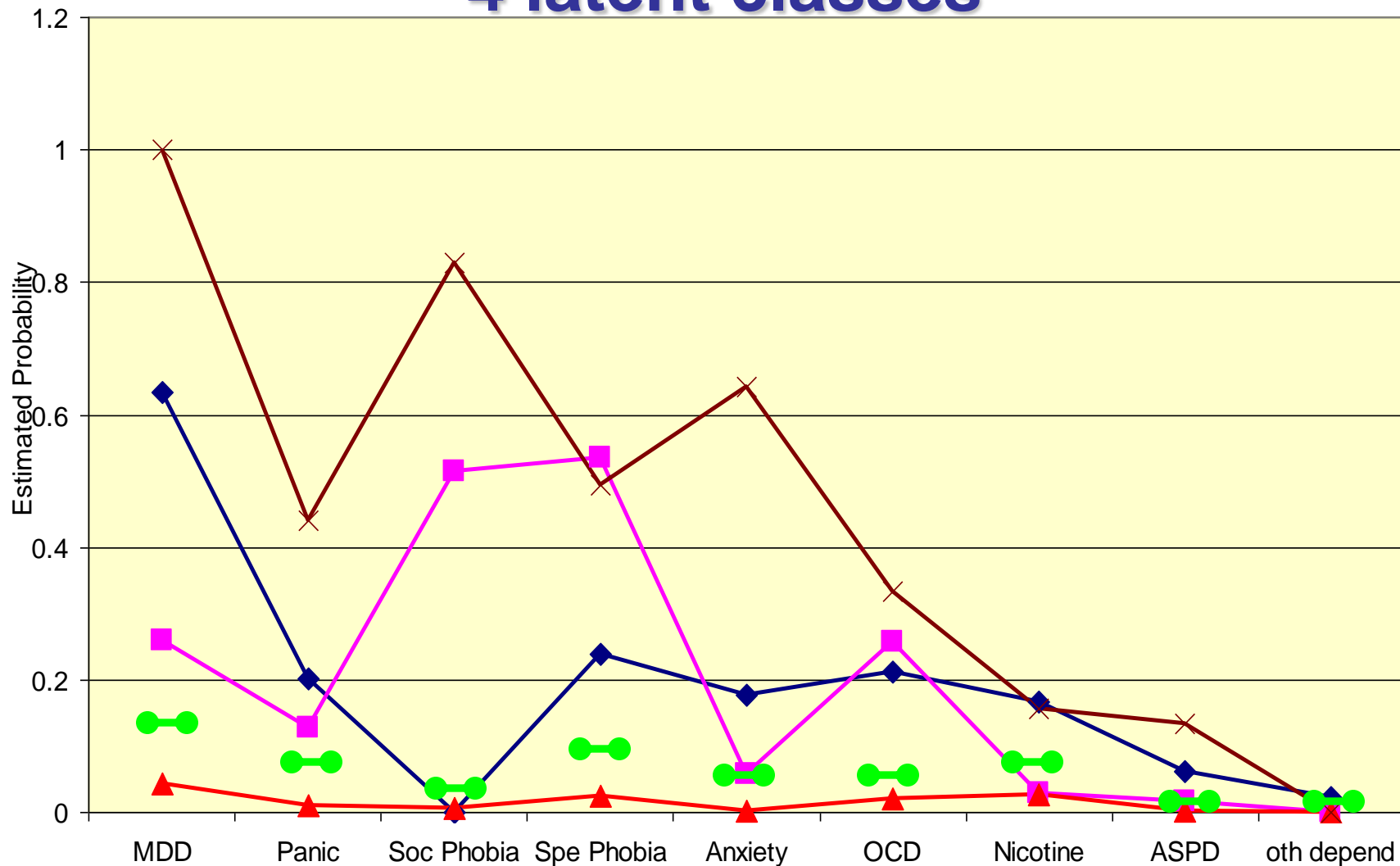
Model selection: BIC comparison

Number of Latent classes

	Two	Three	Four	Five	six	Seven
Abstainers	21682.59	21693.65	21708.08	21735.86	21773.13	—
No alcohol Dx	82689.81	82388.11	82323.47	82310.55	82336.92	82391.98
Abuse only	36101.16	36058.27	36032.81	36078.9	—	—
Dependence only	4568.35	4599.01	4639.2	4682.99	—	—
Abuse & Dependence	32118.62	32001.42	31892.66	31914.58	31952.54	—

Abstainers

4 latent classes

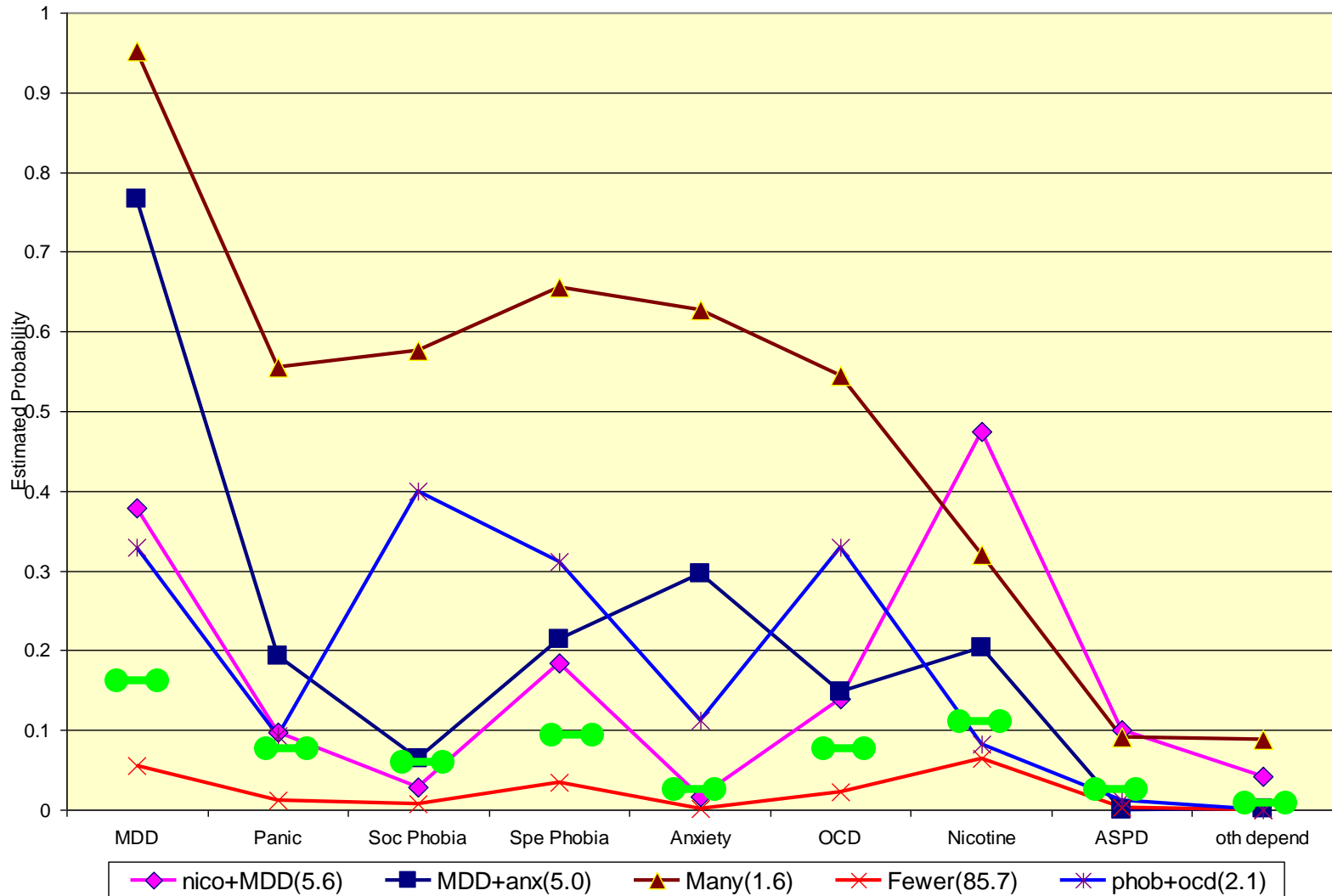


◆ MDD(6.1)
 ■ so+sp phobia(1.7)
 ▲ Fewer(91.3)
 × Mdd+pho+anx(0.9)

●—● Group baseline prevalence

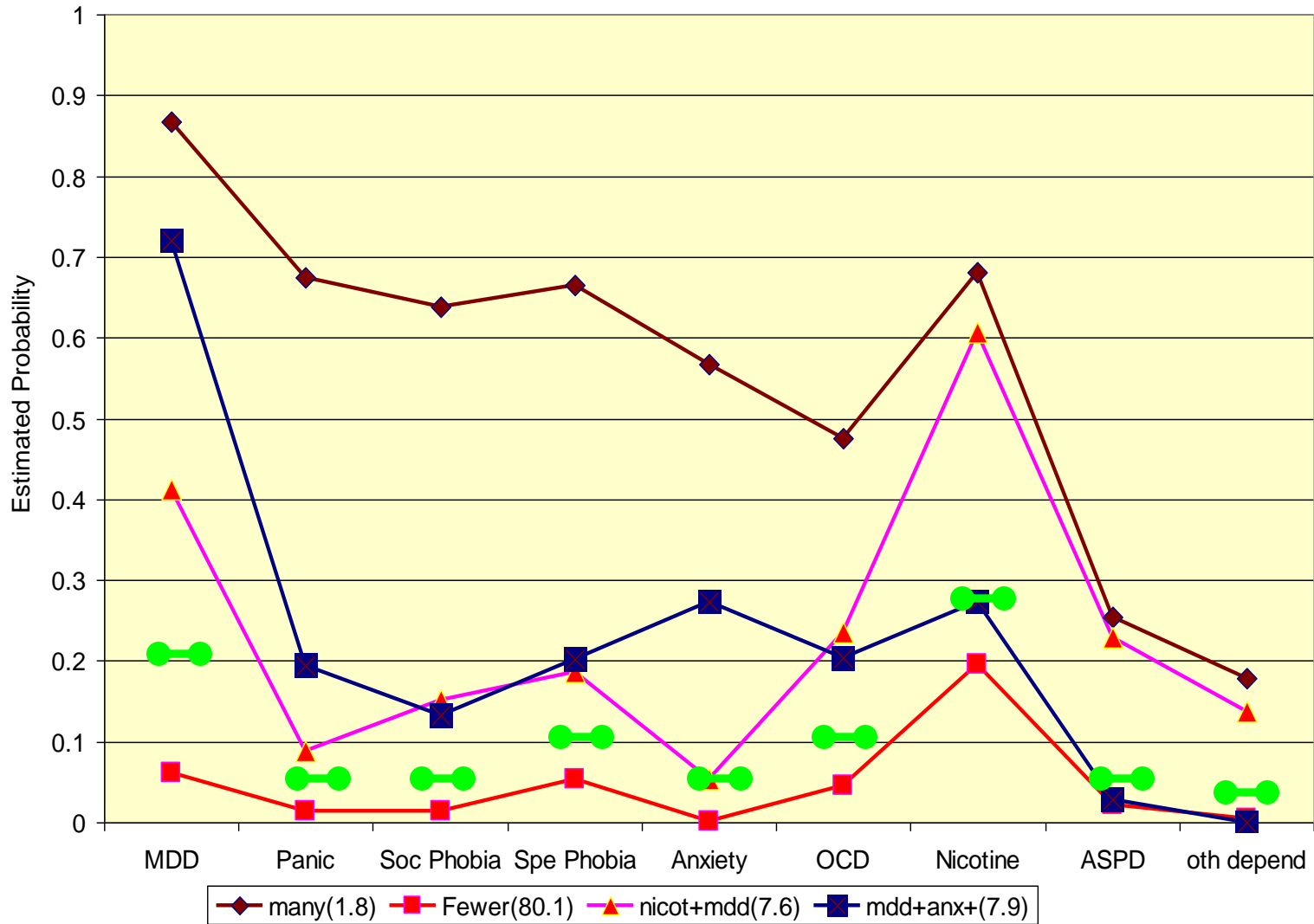
No alcohol Dx group

5 latent classes



Group baseline prevalence

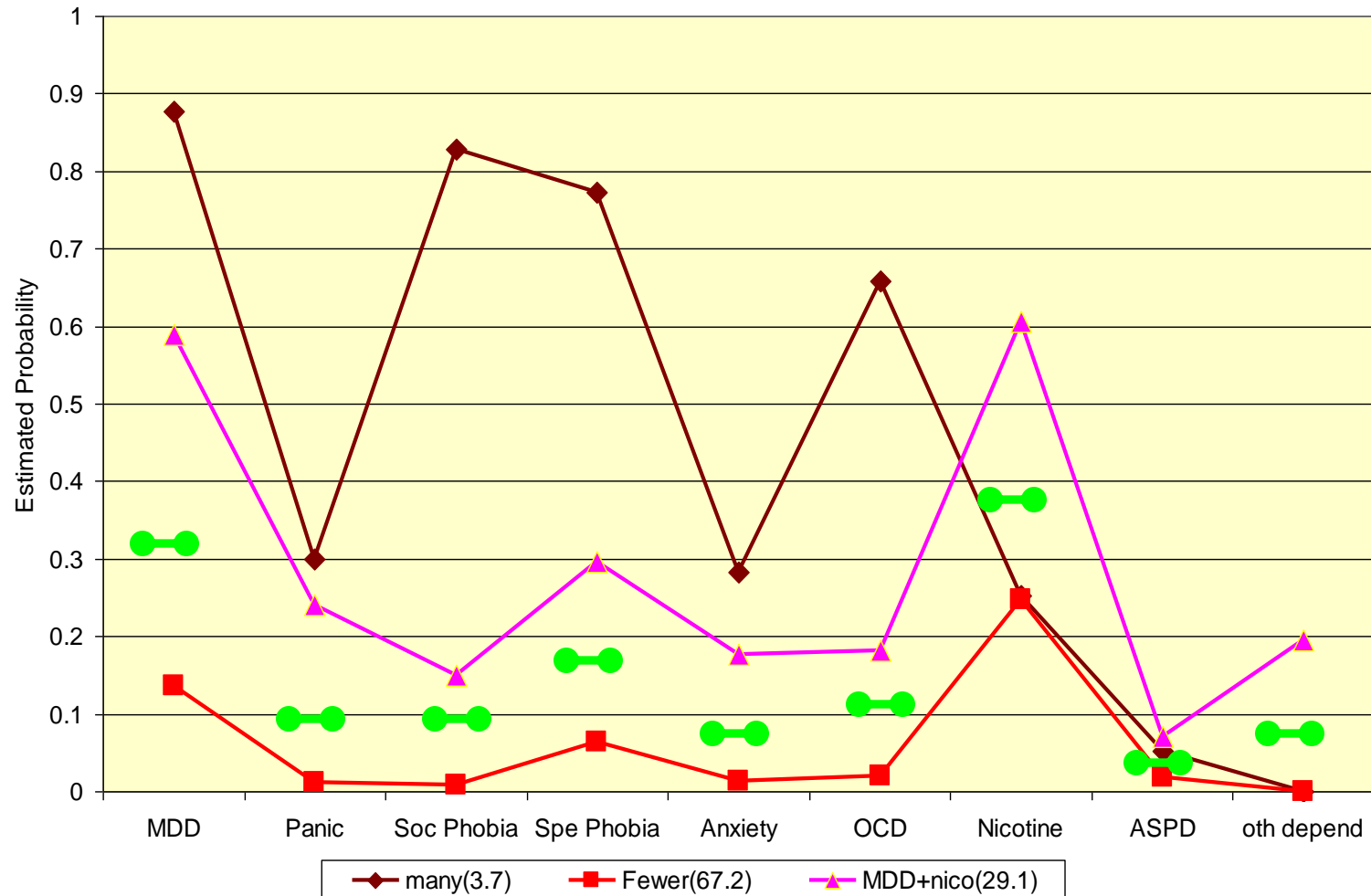
Abuse only group 4 latent classes



● Group baseline prevalence

Dependence only group

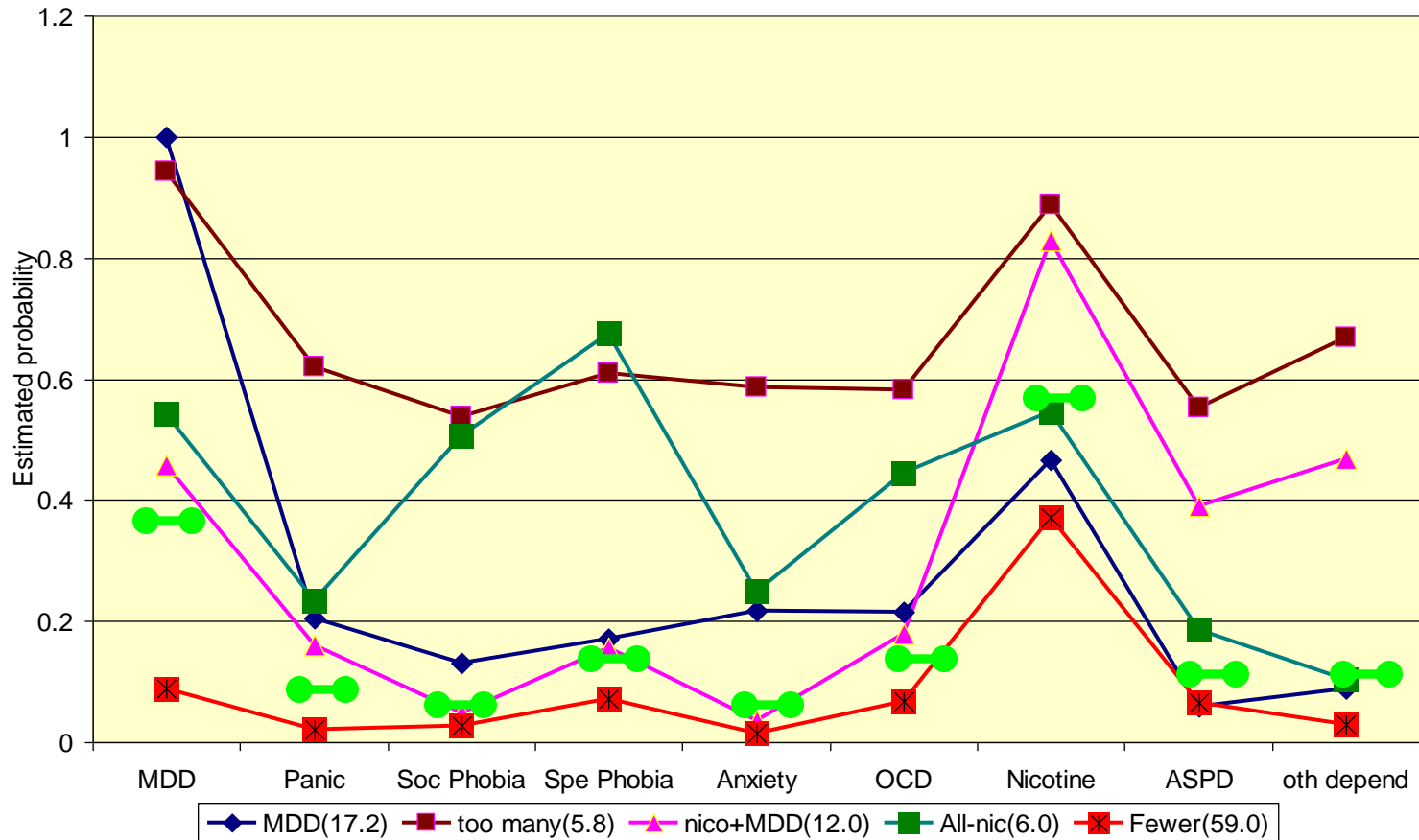
3 latent classes



Group baseline prevalence

Abuse & Dependence group

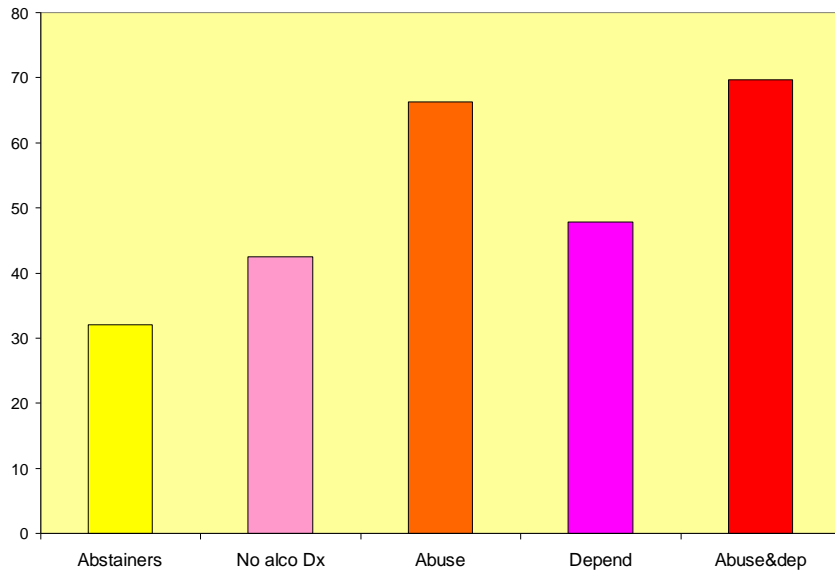
5 latent classes



Group baseline prevalence

Validator: Sex

% of Males



Abstainers, No alcohol Dx, Abuse only,

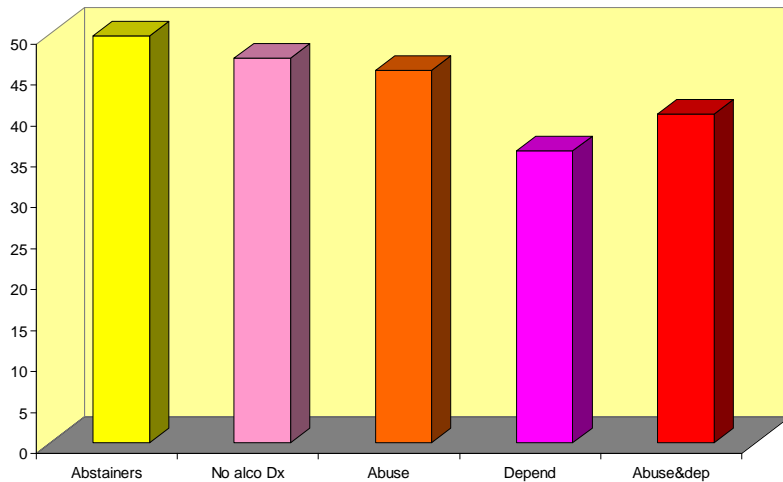
Dependence only, Abuse & dependence

Distribution by latent class

Many	5.74
MDD+Phobia+Anx	17.34
MDD+Anx	19.94
Many	21.13
MDD	21.87
Phobia	26.42
Phobia+OCD	29.48
Many	30.41
fewer	33.02
MDD	34.64
Nic+MDD	39.31
MDD+Anx	43.96
Fewer	44.98
Severe	48.33
MDD	51.88
Fewer	53.92
All-NIC	56.26
Nic+MDD	57.44
Fewer	70.40
Nic+MDD	75.25
Fewer	77.13

Validator: Age

Age (years)



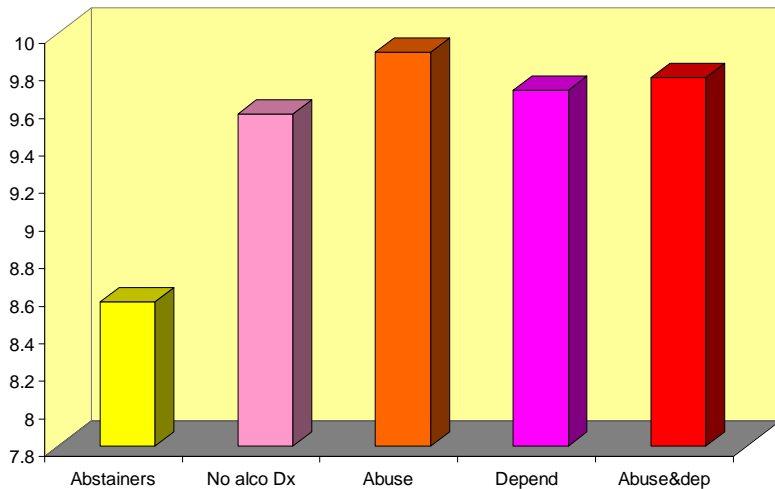
Abstainers,
 No alcohol Dx,
 Abuse only,
 Dependence only,
 Abuse & dependence

Distribution by latent class

Fewer	34.84
Nic+MDD	36.81
Nic+MDD	37.09
Severe	37.93
Many	38.44
Fewer	40.44
Nic+MDD	41.35
MDD	41.36
MDD	41.58
All-NIC	41.85
MDD+Phobia+Anx	42.07
Many	42.95
Many	43.63
Phobia+OCD	44.96
Fewer	46.00
MDD+Anx	46.16
MDD+Anx	46.62
Fewer	47.42
Phobia	47.61
MDD	48.41
fewer	49.85

Validator: Education

Education (Years)



Abstainers, No alcohol Dx, Abuse only,

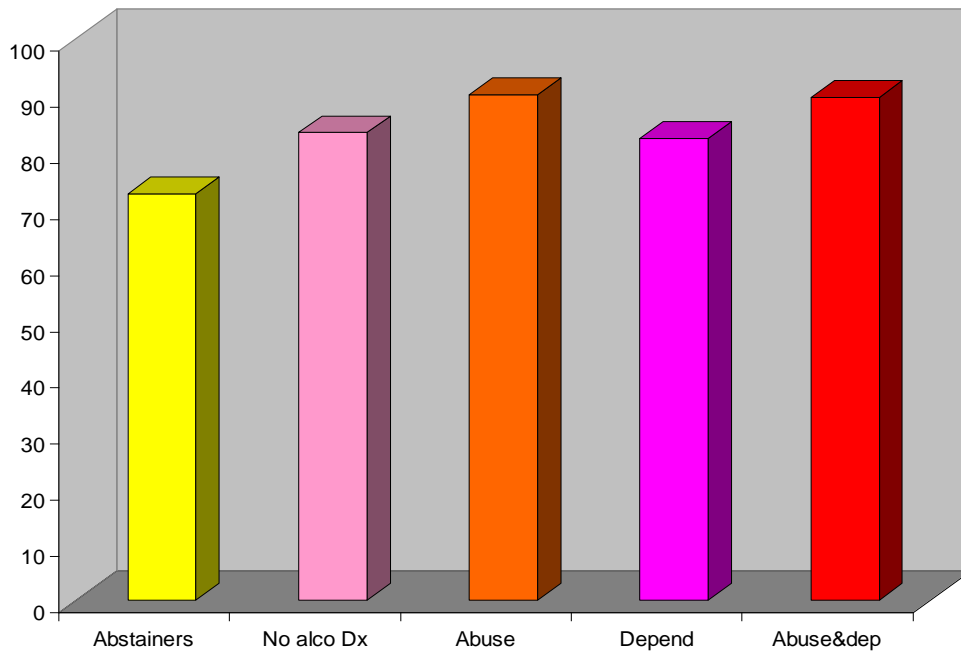
Dependence only, Abuse & dependence

Distribution by latent class

MDD+Phobia+Anx	8.29
MDD	8.54
fewer	8.57
Phobia	8.64
Severe	9.18
MDD	9.33
Many	9.40
Nic+MDD	9.42
Many	9.50
Many	9.53
Nic+MDD	9.53
Fewer	9.56
Nic+MDD	9.62
All-NIC	9.65
Fewer	9.74
Phobia+OCD	9.76
Fewer	9.83
MDD+Anx	9.92
Fewer	9.93
MDD	10.02
MDD+Anx	10.14

Validator: Ethnicity

% Whites



Abstainers, No alcohol Dx, Abuse only,

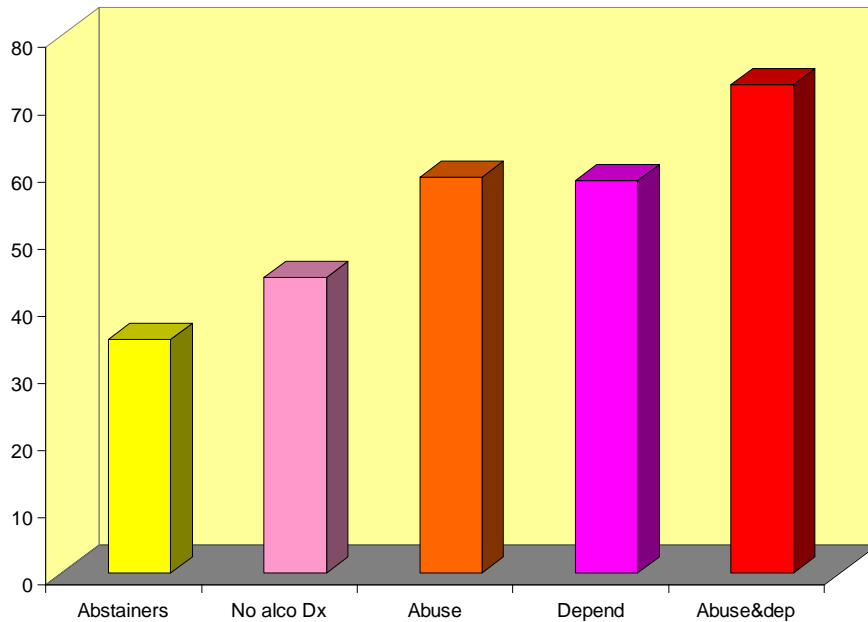
Dependence only, Abuse & dependence

Distribution by latent class

fewer	71.82
Phobia	74.95
MDD	78.34
Fewer	79.18
Fewer	82.68
Phobia+OCD	82.76
MDD+Phobia+Anx	82.83
Nic+MDD	86.77
MDD	87.20
Nic+MDD	87.25
Many	87.25
MDD+Anx	87.35
Fewer	89.22
Nic+MDD	89.29
All-NIC	89.45
Fewer	89.80
Many	91.36
MDD	92.02
Severe	92.05
MDD+Anx	92.97
Many	96.82

Validator: Family History

Family History %



Abstainers,
 No alcohol Dx,
 Abuse only,

Dependence only,
 Abuse & dependence

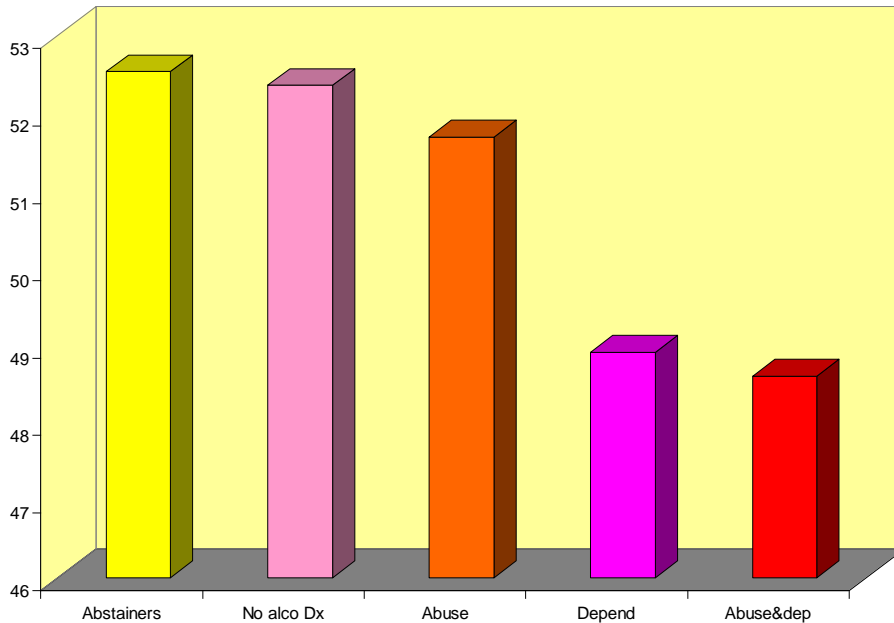
Distribution by latent class

fewer	32.01
Fewer	40.55
Fewer	50.00
Fewer	55.75
Phobia	57.71
MDD+Anx	62.59
Phobia+OCD	62.71
MDD	64.67
MDD	65.04
Fewer	65.53
MDD+Phobia+Anx	65.89
MDD+Anx	68.78
Nic+MDD	71.75
Many	73.16
Nic+MDD	73.22
Many	80.88
Nic+MDD	82.36
MDD	82.58
All-NIC	83.12
Severe	85.67
Many	92.81

Validator: Mental Health Scale

Distribution by latent class

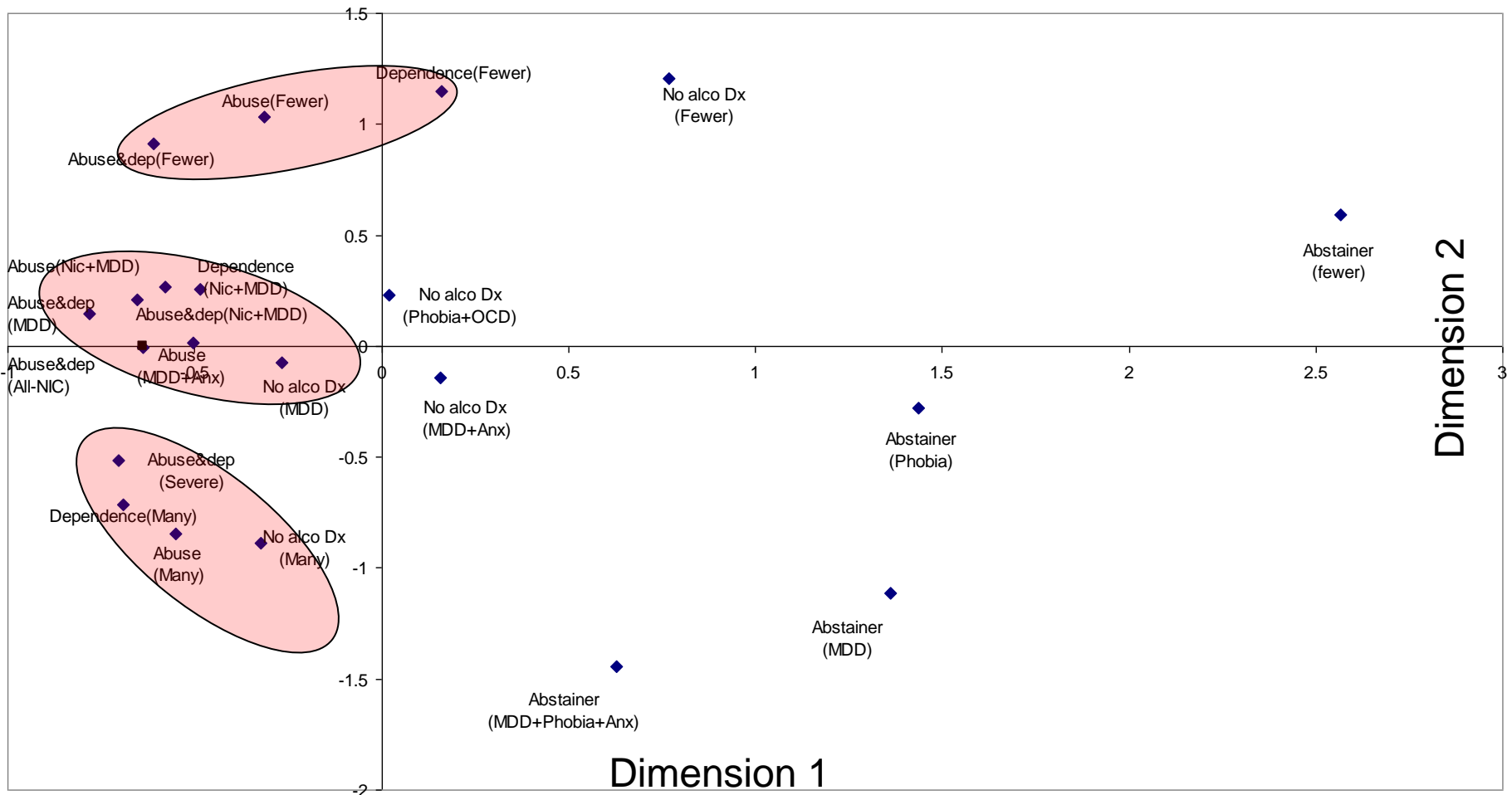
Norm based Mental Health Scale



Abstainers,
 No alcohol Dx,
 Abuse only,
 Dependence only,
 Abuse & dependence

MDD+Phobia+Anx	36.88
Many	37.78
Severe	38.30
Many	38.44
Many	42.36
MDD	42.95
MDD+Anx	44.94
Nic+MDD	45.47
All-NIC	45.53
MDD+Anx	45.58
MDD	45.71
Phobia	46.75
Nic+MDD	46.98
Phobia+OCD	47.48
MDD	47.54
Nic+MDD	47.89
Fewer	50.88
Fewer	51.20
Fewer	53.16
fewer	53.41
Fewer	53.47

Biplot using Multi Dimensional Scaling based on principal normalization



Summary

- **Need to include comorbidities when defining alcohol phenotypes**
- **Phenotypic characteristics of some latent classes are unique**
- **Biplot results shows existence of similar latent classes across groups**
- **Latent class phenotypes will reduce heterogeneity**