All the process was first tested with 212 patients to avoid any computer generated errors. Then we compared results for all patients together and discordance between ODIP and OPCRIT diagnosis was then analysed to determine which corresponded better to the Clinician's diagnosis when available (unavailable for 17 patients with discordant diagnoses).
Results: 88.2% of diagnoses for the 364 patients were equivalent when comparing ODIP and OPCRIT results. For the discordant diagnoses most of them (7.2%) were so mainly because of lack of needed information and when one of the systems provided a wrong diagnosis it was more often the OPCRIT (4.1%) than ODIP (0.5%).
Discussion: We demonstrated the ability of our 13 item ODIP tool to provide more reliable diagnosis than OPCRIT in the context of first episode psychosis with no organic or toxic origin.
Limitations: This tool was not intended to assess affective disorder diagnosis but only specify the diagnosis for the episode. As yet it was tested only on first psychotic episodes.
The primary interest of this new tool is the speed of administration and the relatively simple algorithm implemented in an excel file and available from the authors on request.

T104. ASSESSING THE UTILITY OF COPULA FUNCTIONS FOR RISK PREDICTION OF PSYCHOSIS

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Background: Studies which have attempted to assess the predictive potential of socio-environmental risk factors for psychosis have used such a variety of datasets and methodologies. As a result, it is not possible for policy-makers to understand how different models compare, or might inform evidence-based policy-making. Thus, the cumulative predictive potential of non-genetic risk factors for psychosis has not yet been studied systematically. An important question which has not been considered previously is whether correlation structure between multivariate risks can be detrimental to the goal of prediction, particularly across different populations. Model fitting to locally-relevant correlation structures can limit the generalizability of a prediction model. Copulas are mathematical functions which allow the joint risk function of two or more correlated variables to be modelled in spite of this inherent bias. The copula approach is a foundation methodology with applications in the fields of finance, insurance and banking, where it is used for risk-management purposes. This study examines the impact of copulas on the stability of prediction power for psychosis across different populations.
Methods: The data used in this work comes from work package 2 (WP2) (entitled "Functional Enviromics") of The European Union (EU)-funded European Network Study of Gene-Environment Interactions (EUGEI). The total dataset available consists of 1180 cases of first episode psychosis (ICD10 diagnostic criteria F20-F29 or F30-F33) and 1528 healthy controls recruited by 16 centres across 6 countries (United Kingdom, Holland, Spain, France, Italy, Brazil). We sought to compare the predictive performance of copulas against that of summary risk scores for formulating disease risk for a common set of socio-environmental risk factors. The copula methodology allows joint risks to be modelled as a distribution whilst summary scores convey the number of risk factors encountered by an individual, weighted by literature-derived odds ratios for association. Gaussian copula with non-Gaussian marginal distributions were used to capture the correlation structure of 9 discrete variables in total. These incorporated: Lifetime Cannabis Use, frequency of Cannabis Use, Household discord, severity of psychological abuse, severity of physical abuse, severity of sexual abuse, severity of bullying, number of adverse adult life events and intrusive adult life events. We applied a fully Bayesian approach which uses Markov Chain Monte Carlo to simulate latent variables from multivariate ordered probit model and also estimate the threshold parameters and parameters from copula model. The resulting joint distribution (a copula) mapped the relationship between cumulative exposure to these factors and risk of psychosis.
Results: A proportion of subjects were withheld from the copula, so that the performance of the finished function could be evaluated on unseen data. The performance of the 2 prediction methods was compared within and between recruitment centres and are conveyed in terms of:

- Sensitivity and false positive rates (The area under the Receiver Operating Characteristic curve)
- Percentage of variance explained (Nagelkerke R2)
- Calibration (whether predicted risks were correct)
- Discrimination (whether high risk subjects could be distinguished from low risk ones)
- Reclassification (model behaviour close to specific thresholds)

Discussion: The application of the copula methodology to the multi-centre EUGEI dataset provides us with the opportunity to tackle a major limitation of the summary scoring approach which is the default method for aggregating risks across most areas of health research.

T105. FACTOR ANALYSES OF SUCCESSIVE ASSESSMENTS BY MULTIPLE SCALES HAVE A CONSISTENT STRUCTURE IN A COHORT OF FIRST EPISODE PSYCHOSES

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Background: Depending on the nature of their items factor analyses of different scales impose different structures on the underlying psychopathological dimensions, so a broader range of scale items should be more revealing. Few studies repeat analyses over successive interviews to investigate whether psychopathology has a consistent structure or evolves, especially after first presentations when the illness is most plastic and cohorts are unselected by chronicity.
Methods: A cohort was recruited from consecutive presentations aged 16–35 to NHS Early Intervention in Psychosis services from 14 catchments over 5 years during the National EDEN project. All met DSM IV-R criteria for schizophrenia spectrum psychoses, brief or substance induced psychoses, mania or severe depression with psychosis. At recruitment, after 6 and 12 months each was assessed with Positive and Negative Symptom Scale (PANSS), Calgary Depression Scale (CDS), Young's Mania Rating Scale (MRS) and Birchwood's Insight Scale (IS). At each point principal axis factoring with oblique (Promax) rotation included all scale items simultaneously, apart from using total scores for IS. Items below communality thresholds were excluded and the analyses repeated until stable solutions were achieved with fit metrics meeting conventional thresholds. Factor solutions were selected using breaks in the scree plot and eigenvalues>1.0.
Results: 1003 met diagnostic criteria and 948 provided data. Each time point produced 6 factors featuring consistent items: psychosis (PANSS delusions, hallucinations, suspicion, stereotyped thinking & bizarre ideation; MRS grandiose content); excitement/mania/disorganisation (PANSS agitation; MRS elation, overactivity, pressured and disorganised speech); hostility/suspiciousness (PANSS hostility, uncooperativeness & impulsive irritability; MRS irritability & aggression); depression/anxiety (PANSS anxiety, guilt, depression; CDS subjective & objective depression, guilt & guilty ideas of reference, hopelessness, self-depreciation,

suicidality, early waking); negative symptoms (PANSS blunting, emotional & social withdrawal, poor rapport, poverty of speech, retardation and avolition), and poor insight (PANSS insight, MRS insight, IS total). Depression explained 29–32% of variance at different stages, Psychosis 28–29%, Negative 25–26%, Excitement 19–24%, Hostility 16–23% and Poor Insight 16–23%.
Discussion: The cohort, recruited from consecutive presentations, included a full range of psychoses in sufficient numbers to factor analyse the scales' 51 parameters. There was evidence for 6 factors slightly different from the traditional 3 SAPS/SANS (Scales for the Assessment of Positive and Negative Symptoms) or 5 PANSS factors derived using chronically unwell samples with non-affective psychosis. There was more consistency than in previous first episode follow-up studies and affective and insight dimensions were more clearly defined.

T106. IMPROVING PSYCHIATRIC DIAGNOSIS BY ADDING MOTOR FUNCTION NEXT TO MENTAL HEALTH FUNCTION: A NETWORK APPROACH

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Background: Currently, the predictive value of psychiatric diagnosis is inadequate compared to other medical fields. It has been suggested that the use of a network model might aid in acquiring new insights into the underlying connections between symptoms (Bringmann et al., 2013). In addition, previous research (Bakker et al., 2012) has revealed associations between dysregulated mental- and motor function. As such, the network graphs might be enhanced by adding non-mental factors.
Methods: Baseline data from a 4-year prospective naturalistic study (Bakker et al., 2012) was used to obtain data about 207 psychiatric long-stay patients. (i) Drug-induced movement disorders: tardive dystonia (TD), akathisia, parkinsonism, and dyskinesia. (ii) ratings of the clinical global impression-schizophrenia (CGI) scale, and (iii) age and total defined daily dose to account for potential confounders. Statistical programming environment R (Epskamsp, Cramer, Waldorp & Borsboom, 2012) was used to visualise several psychopathology-severity networks.
Results: Interpretation of the graphs is based on the "centrality" of the symptoms. Centrality indicates the influence of a symptom on the network. Parkinsonism scored a low centrality score in graphs depicting high psychopathology in contrast with the other levels. Dyskinesia scored a low centrality score in medium psychopathology contrary to the other levels. The network graphs show a consistent positive correlation between age and parkinsonism (0.25, 0.53, and 0.19 for low, medium, and high psychopathology, respectively.), and a negative correlation between age and akathisia (-0.32, -0.47, and -0.21, respectively). High severities of psychopathology negatively correlated with parkinsonism (-0.16) and positively correlated with high levels of TD (0.33).
Discussion: The usage of a network model including motor factors has provided useful information to take into consideration when examining psychopathology of a patient. TD and parkinsonism draw the most attention. More research with the dataset, combined with further developing the network architecture technique is needed to accurately map motor- and mental factors.

T107. WHY VALIDATION MATTERS: A DEMONSTRATION PREDICTING ANTIPSYCHOTIC RESPONSE USING 5 RCTS

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Background: Machine learning methods hold promise for making more effective, personalized treatment decisions to improve outcomes and reduce the cost of care. The use of these techniques remains nascent in psychiatry, and relatively little research has focused on the extent to which models derived in one sample make accurate predictions in unseen samples. Statistical research indicates that model performance in unseen samples is generally lower than performance in the derivation sample.
Methods: We investigate the generalizability of machine learned models using data from five multi-site randomized controlled trials of antipsychotic efficacy (total N = 1511). We include 125 predictor variables collected at baseline in all five trials, including demographics, psychological/behavioral scales (AIMS, BARS, CGI, PANSS, and SARS), vital signs, complete blood count, blood chemistry, and urinalysis. Using elastic net regression, we predicted 4-week treatment outcomes according to a binary cut-point of 25% reduction in PANSS scores. This study compared model performance for a range of internal and external validation methodologies.
Results: First, we trained a separate model on each of the five trials with no internal or external validation and obtained single-trial balanced accuracies from 74.6% to 100%. When each trial was split into a 50% training set and 50% holdout set, the balanced accuracies on the holdout test set were between 48% and 60.6%. When models were trained on each trial using 10-fold cross validation, balanced accuracies ranged from 50% to 73.7%. When each model was trained on a single trial and then sequentially tested on each of the four other trials, the mean balanced accuracy for each trial ranged from 50.5% to 54.2%. Finally, when the model was trained on four trials combined and tested on the one trial left out (leave-one-trial-out validation), balanced accuracies ranged from 48.9% to 58.7%.
Discussion: The performance of models predicting antipsychotic treatment response is highly affected by the validation routine chosen. Performance estimated using one trial – even using internal cross-validation – is drastically higher than the performance obtained when the same model is tested on independent data from other clinical trials with similar protocols. These findings present considerable cause for concern regarding the interpretation of predictive analyses based on a single, multi-site trial.

T108. ANALYTICAL AND PREDICTIVE VALIDITY OF HALLUCINATIONS IN FIRST PSYCHOTIC EPISODES

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Background: Some studies of first psychotic episodes have suggested the association between childhood trauma, such as sexual abuse, and the risk of hallucinations.[1] Furthermore, other studies indicated that environment can alter the phenomenological presentation of first psychotic episodes.[2] However, there are no studies about the association between hallucinations in first psychotic episodes and the prognosis of the disease. This is the main objective of this study. We also compared the phenomenological differences between hallucinations in first episode psychosis and persistent hallucinations in patients with chronic psychosis.
Methods: Naturalistic, longitudinal follow-up study in a sample of 173 patients of first psychotic episode attending public mental health service in Area 5 of Valencia region (Spain) in a period between 2010–2017.
We compared first-episode patients with hallucinations (N=38) with two samples: A) First-episode patients without hallucinations (N=137). B) Chronic patients with persistent hallucinations (N=45) from a previous study.[3]
In the first comparison we used the following variables: sociodemographic data, risk factors (such as cannabis consume and immigration), psychiatric