

Profiles and trajectories of mental health service utilisation during Early Intervention in Psychosis.

O'Driscoll, Ciarán.,^{1*} Shaikh, Madiha.,^{1,2} Finamore, Chloe.,³ Platt, Bradley.,³ Pappa, Sofia.,³ Saunders, Robert.¹

1. Research Department of Clinical, Educational and Health Psychology, University College London, London, UK
2. North East London NHS Foundation Trust, London, UK
3. West London NHS Trust, London, UK

This is a preprint, this paper has been accepted for publication in *Schizophrenia Research*.

*Corresponding Author: Ciarán O'Driscoll ucjtcio@ucl.ac.uk

Abstract

Background Early intervention in psychosis services (EIS) support individuals experiencing a first episode of psychosis. Support required will vary in response to the remittance and reoccurrence of symptoms, including relapses. Characterising individuals who will need more intensive support can inform care planning. This study explores service utilisation profiles and their trajectories of service use in a sample of individuals referred to EIS.

Method We analysed service utilisation during the 3 years following referral to EIS (n = 2363) in West London between 2011 and 2020. Mental health service utilisation data were submitted to model-based clustering. Latent growth models were then estimated for identified profiles. Profiles were compared regarding clinical and demographic characteristics and onward pathways of care.

Results: Analyses revealed 5 profiles of individuals attending EIS based on their service utilisation over 3 years. 55.5% of the sample were members of a low utilisation and less clinically severe profile. The distinct service use patterns of these profiles were associated with Health of the Nations Outcome Scale scores at treatment initiation (at total, subscale, and individual item level), along with age and gender. These patterns of use were also associated with onward care and ethnicity.

Conclusions: Profiles and trajectories of service utilisation call for development of integrated care pathways and use of more personalised interventions. Services should consider patient symptoms and characteristics when making clinical decisions informing the provision of care. The profiles represent typical patterns of service use, and identifying factors associated with these subgroups might help optimise EIS support.

Keywords: *psychosis; early intervention; rehabilitation; profiles; trajectories; subgroups*

1 Introduction

Early intervention in psychosis services (EIS) improve access to treatment for individuals experiencing a first episode of psychosis (FEP) (Cheng et al., 2011; Radhakrishnan et al., 2018). While EIS is considered cost effective (Hastrup et al., 2013; McCrone et al., 2010) and to offer better management of FEP than standard treatment (Nordentoft et al., 2014) the course of schizophrenia may require more tailored treatment for individuals, personalised for different patient characteristics.

FEP relates to the emergence or transition to, an acute psychosis characterized by florid psychotic symptoms; sustained symptoms lasting four weeks or more (National Institute for Health and Care Excellence., 2015). Some individuals will only experience one episode and recover, for others symptoms may persist, or there may be a pattern of remission and relapse throughout their lives. While a clinical staging model may be considered as the course of the individual's disorder progresses (Fusar-Poli et al., 2017), reliable stratification models need to be identified and to support optimised care.

Many patients will deteriorate following a first episode (Birchwood, 2003) where relapse is estimated at 49% in the first 3 years (Pelayo-Terán et al., 2017). The risk of relapse increases following discontinuation of medication: 90% over 2 years (Zipursky et al., 2014) – although there are issues around how relapse is operationalised affecting accurate estimation (Gleeson et al., 2010). Additionally, certain patients may not show improvements, approximately 30% of individuals with a FEP do not respond to antipsychotic medication (Harvey and Rosenthal,

2016). Relapse presents challenges not only to the individual, but their support network, and patients may require support in addition to EIS such as from Crisis Assessment and Treatment Teams (CATT) (i.e. Crisis Resolution or Home treatment teams) or inpatient hospital stays. We know that certain symptoms, and the service user's lifestyle and social situation increase the likely need for more support (Lecomte et al., 2008). EIS services work flexibly with patients and discharge requires the prior agreement of patient and referrer. Whether behavioural or symptom-based characteristics are associated with service utilisation is unclear, but such knowledge could inform preventative steps, reducing hospital admissions and benefit patients.

Categorising individuals into subgroups or profiles can be advantageous when considering interactions between complex patient variables (Herzberg and Roth, 2006). Being able to predict a patient's service utilisation trajectory provides an opportunity to implement adaptive treatment approaches. For example, for an individual with numerous hospital admissions during FEP, the primary focus may be medication adherence, rather than vocational support. Clinical decision making is a complex process, balancing competing clinical needs and patient outcomes (e.g. remission vs risk of harm). Identifying service utilisation profiles and patient characteristics associated with them may provide a valuable method of supporting treatment selection (Saunders et al., 2020).

Previous studies have identified FEP trajectories (Abdin et al., 2017; Hall et al., 2019; Hodgekins et al., 2015; van der Ven et al., 2020), and have shown

that while the majority of patients continue to display impairment, they also demonstrate improvement in functioning, and only a minority (3 to 13%) show deterioration. Substance misuse, being male, low socio-economic status and belonging to an ethnic minority, are risk factors associated with poorer functioning over time. A previous EIS study (O'Driscoll et al., 2019) exploring intensive care identified living in supported accommodation and specific health-related factors (BMI, smoking status and age) were related to increased utilisation (hospitalisations and crisis team episodes). The literature to date has explored trajectories across short time scales (one to two years) rather than covering the 3-years of EIS support and pertain to social functioning as an outcome rather than care provision. The ability to address these limitations while considering multiple patient characteristics may provide more informative patient profiles.

The primary aim of this study was to identify profiles of service use and associated trajectories over 3 years of EIS. Secondary aims were to (a) explore clinical characteristics associated with profile membership and (b) examine how these profiles of care relate to onward care (e.g. discharge to primary care, further community care).

2 Material & Methods

2.1 Case identification

The Clinical Record Interactive Search (CRIS) database provides research access to anonymised electronic health records information. All projects using the CRIS data resource are considered and approved by an oversight committee, including clinicians and patients. The study was approved by

West London NHS Trust (Project No: 1726).

We identified patients with first episode psychosis receiving care within a West London NHS Trust between 1st January 2011 and 01 March 2020. Included cases were at least 18 years old on admission to the EIS. Demographic information (gender, age, ethnicity, and first language) were extracted from routinely completed fields.

Clinical and diagnostic information, including the Health of the Nations Outcome Scale (HoNOS) scores (Wing et al., 1998) and International Classification of Diseases (ICD-10) diagnoses (World Health Organization., 1993), were also extracted. The HoNOS measures symptoms and social functioning comprising 12 domains, (Table A.1), with each scale rated by staff from 0 ('No problem') to 4 ('Severe to very severe problem'). There are 4 subscales: behaviour (items 1-3), impairment (items 4-5), symptoms (items 6-8) and social functioning (items 9-12).

Measures of each individual's co-occurring mental health service use alongside their admission to EIS with respect to inpatient hospitalisation and Crisis Assessment and Treatment Teams (CATT) were determined by systematic data extraction from CRIS.

2.2 Statistical Analyses

The data cleaning process is outlined in the Supplementary Material.

2.2.1 Model-based Clustering

Model-based clustering identifies statistically distinct sub-groups of individuals based on indicator variables and estimates posterior probabilities for the likelihood that an individual belongs

in each profile. Individuals are allocated to sub-groups/profiles to which they have the highest probability of membership. The included indicators were total days 'in contact' with either EIP or CATT services, and total length of inpatient episodes. As the time-specific variables were count data (total days in each service over the 3 year period), Blom transformation was performed on the data (Blom, 1958). Variables were screened for near-zero variance and high correlations (>.75). Analyses were carried out with the mclust package in R (Scrucca et al., 2016). Mclust, runs a user-specified number of competing models (model parameters allowed variation in the distribution, volume, and shape of the variance) with the best fitting model reflected by lower Bayesian Information Criterion (BIC) values and lower integrated completed likelihood (ICL). Bootstrap likelihood ratio tests (BLRT) were performed to further support the model fit decisions. The BLRT successively tests fitted models to determine whether the less restrictive model fits significantly better than the more restricted model (e.g. three profiles vs. two).

Trajectories of the probability of being in contact with each service over the three-year period of EIS involvement were estimated for each identified profile, using latent growth modelling. The data were transformed into 3-month intervals, and an ordered categorical variable 'service' was used as an ordered dependent variable in growth models. This variable was ordered in relation to healthcare service resource utilisation with 'community' (services within primary care) the lowest level of this variable, followed by EIP, CATT and then inpatient as the highest level of utilisation. In 3-month time periods where patients had episodes with more than one of these

services the patient was allocated to the highest-level category of all services present. Latent growth models were estimated in Mplus (Muthén & Muthén, 2017) with linear, quadratic and cubic factors fitted to account for potential changes in the form of trajectories over time, reflecting changes in the probability of service utilisation.

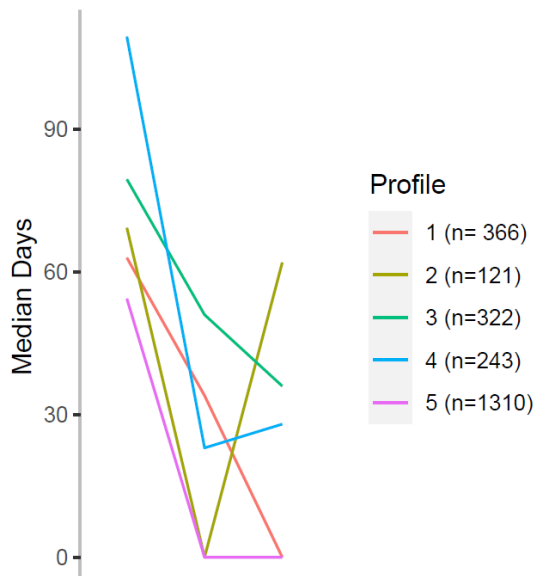
Multinomial regression models were used to investigate potential associations between patient characteristics and the identified profiles. Regression models controlled for age and gender, in the subscale analysis all other subscales, and at individual item level, all other items. A chi-squared test was conducted to estimate the association between profile membership and further service utilisation after 3 years, following EIS.

3 Results

3.1 Sample description

Patients (n =2340) were on average aged 24 (SD:5) years and 63% male in a diverse ethnic sample (36% white). Service users spent an average of 618 (SD:43) days in EIS with a mean of 1.09 episodes with EIS (SD:0.32, range:1-4); an average of 20 days (SD:37) in CATT with a mean of 0.93 episodes (SD:1.45, range:0-10) and an average of 34 days (SD: 101) as an inpatient with a mean of 0.49 inpatient episodes (SD:0.95, range:0-8). The descriptive and summary statistics of each profile later identified in the model-based clustering alongside the full sample of patients who entered treatment are presented in Table A.1.

3.2 Model based Clustering and Latent trajectories



	EIS M (SD) / Median	CATT M (SD) / Median	Inpatient M (SD) / Median
1 (n=366)	607.2 (451.3) / 630	50.1 (40.1) / 34	0 (0) / 0
2 (n=121)	634.3 (453.7) / 693	0.2 (1.4) / 0	148.5 (214.6) / 62
3 (n=322)	655.9 (433.3) / 795	64.6 (51.5) / 51	51.5 (47.2) / 36
4 (n=243)	962.7 (278.7) / 1095	32.4 (29.3) / 23	189.6 (183.3) / 28
5 (n=1310)	436.8 (441.5) / 544	0.6 (2.3) / 0	0 (0) / 0

Figure 1: Five identified profiles characterised by median service use. EIS days have been divided by 10 for visualisation.

Table 1: Service usage in each profile.

A 5-profile model was the best fitting solution (ellipsoidal clusters, equal volume and shape, N =2362) of service utilisation (Figure1 and Table 1). Latent growth curves for each profile displaying the likelihood of using either community, EIP, CATT or inpatient services in 3-month intervals from EIP start are presented in Figure 2. For all profiles except Profile 4, the likelihood of using community services increased as the likelihood of using EIP, CATT or Inpatient services decreased over time. A detailed description of trajectories is provided in Supplementary Materials.

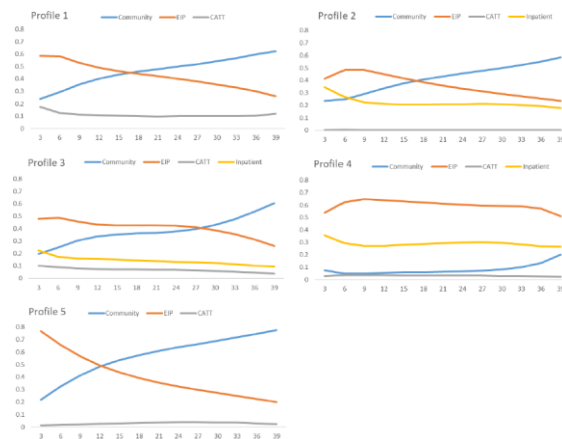


Figure 2: Growth curves for each profile. Probability of service utilisation on the vertical axes and month number (3-month intervals) on the horizontal axes of each plot. Lines represent specific services

3.3 Association between profiles and HoNOS

Multinomial logistic regressions were constructed to model the relationship between the patient-level predictors and profile membership (Tables A.2 to A.5). Profiles differed based on HoNOS total score, $F(4,902) = 4.77, p < 0.001$ with profile 5 significantly lower than profile 3 and 4 (adjusted $p < 0.01$).

As this profile was also low in EIS use it was used as the reference profile. An initial model was estimated to identify the relationship between age and gender on profile membership (Table A.6). For age, compared to being in the low EIS profile (profile 5), the odds of being in profile-4, reduced by 0.96 for every year increase.

Being male increased the likelihood of being in profile-4 (OR: 1.53) but decreased the likelihood of being in

profile-1 (OR:0.74) compared to profile-5.

HoNOS total score was associated with increased odds of members to profiles 1,3, and 4 (OR:1.03, 1.04 and 1.04 respectively), compared to profile-5. At the subscale level, behaviour was associated with membership to profiles 1 to 3 (OR:1.08, 1.21, 1.16 respectively), and impairment with profile-4 (OR:1.14). While for the symptom subscale, there was a reduced likelihood of membership to profile-2 compared to profile-5 for each increase in symptom subscale score (OR:0.89).

At the individual item level, aggression was significantly associated with increased odds of being in profile-1 (OR:1.20) and profile-3 (OR:1.21) compared to profile-5. Substance misuse was significantly associated with increased odds of being in profile-2 (OR:1.39). Cognition was significantly associated with an increased odds of being in profile-2 (OR:1.36) and 4 (OR:1.41) compared to profile-5. Hallucinations and Delusions were significantly associated with an increased odds of being in profile-3 (OR:1.15) and 4 (OR:1.17). While 'other symptoms' were significantly associated with reduced odds of being in profile-2 (OR:0.79).

3.4 Service utilisation after 3 years.

At the end of the EIS period (3 years after first referral), we identified the service the individual was next referred to after this time. Of the total sample (n=2193), 52% had been referred back to primary care. A chi-square test of independence showed that there was a significant association between profile and subsequent referral site, $X^2(16, N = 2193) = 236.39, p < 0.001$. In the

mosaic plot (Figure 3), the width of the boxes are proportional to the percentage of episodes from each profile, the height is proportional to the percentage of the total sample referred to respective services, and the colour and shading reflect the size and direction of the residual. The frequency of referrals from profile-5 to primary care were higher than expected (Pearson residual=5.24) and lower than expected to inpatient (-3.15) and CMHT (-3.63). Profile-4 demonstrated a higher than expected frequency of episodes to CMHT (6.41) and inpatient (5.2). While profile 3 demonstrated higher than expected episodes to assessment teams (5.63) and lower than expected to Primary care (-4.59). A barchart and contingency table are provided (Figure A.1; Table A.6).

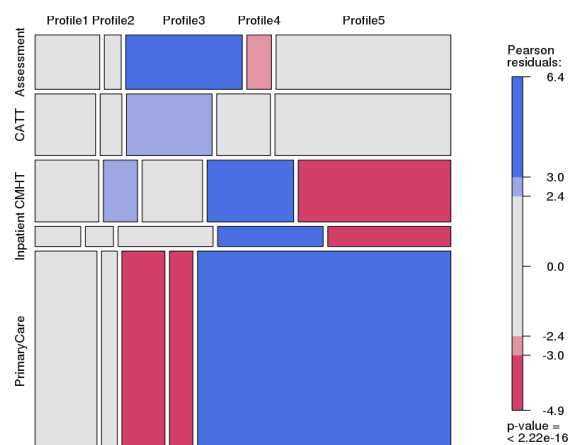


Figure 3: Mosaic plot (a graphical contingency plot) reflecting the service provision after the 3-year EIS period. The colour and shading reflect the size and direction of the residual.

3.5 Ethnicity and profile membership

Associations were explored to identify any inequalities in service provision due to ethnicity (Table A.7). There were also notable differences in profile membership by ethnicity, when

compared to the likelihood of being White British, when controlling for age and gender (Table A.8). Individuals identifying as, Asian or Asian British – Other (OR:1.70), Indian / British Indian (OR:1.58) and Biracial (OR:2.04) had an increased likelihood of being in profile-1, compared to profile-5, than White British service users. Those who identified as Black African/ British African (OR:2.09) displayed an increased likelihood, while being White-European a reduced likelihood (OR:0.22), of being in profile 2 compared to profile-5. Black African/ British African (OR:2.41), Biracial (OR:2.23) and Indian / British Indian (OR:2.32) had a greater likelihood of being in profile 3, compared to profile-5. For profile-4, Black or Black British - Other (OR:3.21) and Black African/ British African (OR:2.6) had approximately a three times increased likelihood of membership of profile-4, compared to profile-5.

4 Discussion

In this study we classified patients into profiles, by modelling the duration of time spent in each service. We explored the trajectory of service use over 3 years following initial referral to EIS, the associated clinical and sociodemographic characteristics of these profiles and onward service utilisation.

We identified 5 profiles of patients based on their service utilisation over 3 years. The distinct service use patterns of these profiles were associated with HoNOS scores at treatment initiation (at the total, subscale and individual item level), age, gender, onward care and ethnicity. While the largest profile (5) of patients had the lowest level of input (with a median duration of 18 months in EIS), the other profiles varied in usage, reflecting a change course of FEP.

Profile-5, was the largest profile, representing low EIS use and a less clinically severe profile characterised by low HoNOS total score in comparison to profiles 3 and 4 and higher than expected referrals to primary care following 3 years in EIS. Individuals may be discharged following a period of assessment and be deemed to not meet criteria for a first episode of psychosis or have a short period of care following an episode and no longer require input. Individuals who are referred to, but disengage from, EIS may also be in this profile reflecting a harder to reach sample however, as data was available 3 years following admission, if a significant episode had occurred, then they would have been expected to be re-referred.

Profile-1 was characterised by moderate EIS service, and moderate CATT use mostly utilised at the beginning of EIS. Compared to profile-5, likelihood of being included was associated with being female, more likely to be Asian or Asian British - Other, Indian / British Indian or Biracial, a higher total HoNOS score and higher behavioural subscale score, specifically on the aggression item. The absence of inpatient care is noteworthy in this profile. The higher likelihood of being female may reflect the ability to manage symptoms in the community and may distinguish this profile from profile-3.

Profile-2 was characterised by moderate EIS service, and high inpatient use. Inpatient use is highest at the start, and gradually reducing over the EIS period. Factors associated with membership to this profile were higher behavioural subscale scores, particularly substance misuse, higher score for cognitive difficulties and increased likelihood of being Black African / British African and reduced

likelihood of being White European. Conversely, this profile was associated with lower symptom subscale score, specifically for other symptoms (i.e. comorbidity). It's notable that this profile appears to lack the transition through CATT, suggesting something about either the clinical decision making or their trajectory over time. Presenting early on with a greater likelihood of substance misuse and cognitive difficulties may indicate markers for chronicity (i.e. negative symptoms). Duration of untreated psychosis appears to be pertinent in better understanding this profile. It may also be indicative of a longer duration of untreated psychosis (DUP), which is likely to be independent of ethnicity (Black-African groups have a shorter DUP relative to White groups) (Schoer et al., 2019). While the HoNOS doesn't capture negative symptoms directly it would be expected that social functioning subscale would have captured this. That this profile less likely than Profile-5 to have pathological symptoms is also remarkable, although this may reflect masking (or use of substances as a coping mechanism).

Profile-3 was characterised by moderate EIS service, with high CATT and moderate inpatient use. The EIS and CATT use trajectories were stable over the 3 year period while inpatient use gradually reduced over time. This profile was more likely to have a higher HoNOS total score, higher behavioural subscale score, specifically on the aggression item, a higher hallucinations and delusions score and more likely to be Black African / British African, Biracial and Indian. This profile was similar to Profile-1 and the higher likelihood of profile membership due to hallucination and delusion score did not explain the difference between Profile-1 and 3. This profile demonstrated higher than expected referrals to the

assessment team and lower than expected to primary care.

Profile-4 was characterised by high EIS, moderate CATT and moderate inpatient use. The trajectory of CATT use displayed a low but stable probability. While EIS and inpatient demonstrated higher probabilities, similar to profile-2, the probability of inpatient use was higher at the start and appeared stable thereafter. Notably, there was a low and stable probability of being referred to primary care during this period in contrast to the other profiles. The likelihood of being included in this profile was associated with being younger in age, being male, having a higher HoNOS total score, higher impairment score, specifically cognition and a higher hallucinations and delusions score and more likely to be Black / Black British – Other and Black African / British African. This profile demonstrated a higher than expected frequency of referrals to CMHT and inpatient following EIS and overall reflects a high use, more severe or chronic profile. In comparison to the other profiles, it appears to take longer for these individuals to stabilise, and there is a large proportion who continue to require inpatient support throughout and following the 3-year period. These insights may facilitate considerations for specific forms of service need. A stepped-care approach could potentially be suitable in EIS. Rather than determining intensity of intervention based on level of risk, potentially HoNOS scores and detailed profiling based on clinical characteristics could be a more meaningful way to target biopsychosocial interventions. This approach supports the view of non-psychology staff delivering low-level psychological interventions to less clinically severe profiles whilst psychologists target harder to engage

and potentially high symptom, complex trauma, low functioning profiles.

Certain differences between profiles may reflect background disadvantages such as trauma, socio-economic adversity and systematic racism (Jones et al., 2017) impacting neuro development, engagement (Doyle et al., 2014) and clinical decision-making, particularly in regard to use of mental health act and hospitalisation. The disparity between profiles 1 and 3 may relate to decisions made by services to refer someone to inpatient instead of a crisis team, or the referral/acceptance criteria of a service which may prioritise certain types of patients. The combination of different characteristics may be deemed more manageable or appropriate, for certain services.

Across profiles ethnicity appears to be associated with inpatient treatment, in particular being Black African/ British African. This finding is similar to other studies (Bruce and Smith, 2020; Oduola et al., 2019) where Black African individuals (and Black individuals generally), are more likely to be admitted to hospital and have longer admissions than white British individuals. For Black communities hospital care is central to the negative perception of mental health services, where poor, if not traumatic, experiences impede recovery (Keating et al., 2002). More prospective, rather than retrospective consideration of cultural appropriateness in the delivery of EIS interventions (Edge and Grey, 2018), assessing for trauma resulting from hospitalisation, and considering how ethnicity may be implicitly factored into clinical decision making is warranted. Involving carers and aiding carers from ethnicity minorities on how to negotiate with mental health services may help address inequalities in service provision. Developing links with the

local service user groups as well as close ties to community-based groups may also help engaging ethnic minorities with the service agenda and influence this process in order to accommodate cultural differences and recognise biases.

The referral destination after the 3-year period needs to be considered separately from a discharge destination (as individuals may have been discharged within the 3-year period) and relates more to their trajectory of care. Discharge to primary care indicates that a patient will be placed under the care of their general practitioner as opposed to a specialist mental health service. Discharge rates to primary care have been shown to be high, however relapse rates are highest shortly after leaving EIS (Puntis et al., 2018). The rates here likely reflect a longer overview of care, where individuals initially discharged from EIS may relapse and be rereferred to services. Better continuity of care and smoother transitioning between services (an integrated care system approach) needs to be considered to allow integration and rehabilitation into primary care and community, for instance, improving joint working with drug and alcohol services, given the prominence of substance use for profile-2.

Profiles 2 and 4, where individuals are displaying a pattern of intensive service use, (i.e. not following a recovery trajectory), are more likely to transition to secondary care services. Improving care pathways for these individuals may include collaborating with specialist rehabilitative services and considering a more rehabilitative approach earlier (National Institute for Health and Care Excellence., 2020) or co-ordinating around providing intensive support over a longer period

of time (French, 2020). One specific rehabilitative gap may be addressing negative symptoms and cognitive dysfunction within EIS. Existing therapies in EIS tend to address positive symptoms rather than negative symptoms (Austin et al., 2015). Negative symptoms are associated with worse functioning at entry (Rammou et al., 2019) and represent a poor prognostic indicator, contributing most to poorer subjective quality of life and functioning (Savill et al., 2016) mediating the association between cognition and community functioning (Gard et al., 2009). Cognitive remediation (with therapist-supported practice of rehabilitation) has been evidenced to address negative symptoms (Cella et al., 2017). This might require a shift in emphasis to embody a biopsychosocial approach in psychological formulation placing greater weight on the neurocognitive presentation. Initial assessments should therefore screen for negative symptomatology and cognitive difficulties, to identify those in need neurocognitive and ADL input.

4.1 Limitations

The study presents a representative and demographically diverse patient sample accessing EIS. The data covers a number of years, across which approaches to EIS have been changing, this includes greater provision of psychological and occupational therapies, retaining individuals on the EIS caseload for longer periods and the transition to age inclusive services.

The choice of variables in the current analysis was clinically driven although the analysis lacks potentially important clinical variables (DUP would be particularly valuable). There is insufficient data on those who disengage from services completely,

this hard to reach sample are an important subgroup. The analysis presented is descriptive and while comparison to the reference group improves interpretability, the lack of prediction and testing in a holdout sample reduces generalisability. Missing data for the HoNOS (39 - 47%), potentially reduce the descriptive accuracy of the profiles. Information for biological and additional social variables linked to outcomes in psychosis should be included in predictive modelling in clinical services (Osimo et al., 2020). Improving the collection of a combination of different markers could increase the specificity and sensitivity of predictive methods with the potential for computer-assisted applications in services to enable personalised individual level treatment plans (Freeman et al., 2019; Koutsouleris, 2019).

Future research could consider time varying covariates, such as whether events that occur during a trajectory alter the trajectory itself. Furthermore, predicting trajectories and prognosis of individuals presenting with psychosis requires an integrated approach combining service use and clinical characteristics with multiple factors including biological predictors of illness, neurocognitive and environmental. Replication of these findings in this study, in a separate sample and EIS setting would improve generalisability and would have important implications to inform policy around service provision.

4.2 Conclusion

This study presents patterns of service use and their association with clinical characteristics assessed at the initial stages of EIS involvement. This may provide considerations around potential trajectories and need for more personalised or symptom specific

interventions. The profiles represent typical patterns of service use and may enable services to target distinct

profiles in a more meaningful way by providing different levels of support or implement prophylactic interventions.

References

- Abdin, E., Chong, S.A., Vaingankar, J.A., Peh, C.X., Poon, L.Y., Rao, S., Verma, S., Subramaniam, M., 2017. Trajectories of positive, negative and general psychopathology symptoms in first episode psychosis and their relationship with functioning over a 2-year follow-up period. *PLoS One* 12, 1–16. <https://doi.org/10.1371/journal.pone.0187141>
- Austin, S.F., Mors, O., Budtz-Jørgensen, E., Secher, R.G., Hjorthøj, C.R., Bertelsen, M., Jeppesen, P., Petersen, L., Thorup, A., Nordentoft, M., 2015. Long-term trajectories of positive and negative symptoms in first episode psychosis: A 10year follow-up study in the OPUS cohort. *Schizophr. Res.* 168, 84–91. <https://doi.org/10.1016/j.schres.2015.07.021>
- Birchwood, M., 2003. Pathways to emotional dysfunction in first-episode psychosis. *Br. J. Psychiatry* 182, 373–5. <https://doi.org/10.1192/bjp.02.153>
- Blom, G., 1958. *Statistical estimates and transformed beta-variables*. Wiley, New York.
- Bruce, M., Smith, J., 2020. Length of stay among multi-ethnic psychiatric inpatients in the United Kingdom. *Compr. Psychiatry* 102, 152201. <https://doi.org/10.1016/j.comppsy.2020.152201>
- Cella, M., Preti, A., Edwards, C., Dow, T., Wykes, T., 2017. Cognitive remediation for negative symptoms of schizophrenia: A network meta-analysis. *Clin. Psychol. Rev.* 52, 43–51. <https://doi.org/10.1016/j.cpr.2016.11.009>
- Cheng, F., Kirkbride, J.B., Lennox, B.R., Perez, J., Masson, K., Lawrence, K., Hill, K., Feeley, L., Painter, M., Murray, G.K., Gallagher, O., Bullmore, E.T., Jones, P.B., 2011. Administrative incidence of psychosis assessed in an early intervention service in England: first epidemiological evidence from a diverse, rural and urban setting. *Psychol. Med.* 41, 949–958. <https://doi.org/10.1017/S0033291710002461>
- Doyle, R., Turner, N., Fanning, F., Brennan, D., Renwick, L., Lawlor, E., Clarke, M., 2014. First-Episode Psychosis and Disengagement From Treatment: A Systematic Review. *Psychiatr. Serv.* 65, 603–611. <https://doi.org/10.1176/appi.ps.201200570>
- Edge, D., Grey, P., 2018. An Assets-Based Approach to Co-Producing a Culturally Adapted Family Intervention (CaFI) with African Caribbeans Diagnosed with Schizophrenia and Their Families. *Ethn. Dis.* 28, 485–492. <https://doi.org/10.18865/ed.28.S2.485>
- Freeman, D., Taylor, K.M., Molodynski, A., Waite, F., 2019. Treatable clinical intervention targets for patients with schizophrenia. *Schizophr. Res.* 211, 44–50. <https://doi.org/10.1016/j.schres.2019.07.016>
- French, P., 2020. What has Rehabilitation got to do with Early intervention in Psychosis? [WWW Document]. IEPA. URL <https://iepa.org.au/network-news/what-has-rehabilitation-got-to-do-with-early-intervention-in-psychosis/> (accessed 10.1.20).
- Fusar-Poli, P., McGorry, P.D., Kane, J.M., 2017. Improving outcomes of first-episode psychosis: an overview. *World Psychiatry* 16, 251–265. <https://doi.org/10.1002/wps.20446>

- Gard, D.E., Fisher, M., Garrett, C., Genevsky, A., Vinogradov, S., 2009. Motivation and its Relationship to Neurocognition, Social Cognition, and Functional Outcome in Schizophrenia. *Schizophr. Res.* 115, 74–81. <https://doi.org/10.1016/j.schres.2009.08.015>
- Gleeson, J.F.M., Alvarez-Jimenez, M., Cotton, S.M., Parker, A.G., Hetrick, S., 2010. A systematic review of relapse measurement in randomized controlled trials of relapse prevention in first-episode psychosis. *Schizophr. Res.* 119, 79–88. <https://doi.org/10.1016/j.schres.2010.02.1073>
- Hall, M.H., Holton, K.M., Öngür, D., Montrose, D., Keshavan, M.S., 2019. Longitudinal trajectory of early functional recovery in patients with first episode psychosis. *Schizophr. Res.* 209, 234–244. <https://doi.org/10.1016/j.schres.2019.02.003>
- Harvey, P.D., Rosenthal, J.B., 2016. Treatment resistant schizophrenia: Course of brain structure and function. *Prog. Neuro-Psychopharmacology Biol. Psychiatry* 70, 111–116. <https://doi.org/10.1016/j.pnpbp.2016.02.008>
- Hastrup, L.H., Kronborg, C., Bertelsen, M., Jeppesen, P., Jorgensen, P., Petersen, L., Thorup, A., Simonsen, E., Nordentoft, M., 2013. Cost-effectiveness of early intervention in first-episode psychosis: Economic evaluation of a randomised controlled trial (the OPUS study). *Br. J. Psychiatry* 202, 35–41. <https://doi.org/10.1192/bjp.bp.112.112300>
- Herzberg, P.Y., Roth, M., 2006. Beyond resilient, undercontrollers, and overcontrollers? An extension of personality prototype research. *Eur. J. Pers.* 20, 5–28. <https://doi.org/10.1002/per.557>
- Hodgekins, J., Birchwood, M., Christopher, R., Marshall, M., Coker, S., Everard, L., Lester, H., Jones, P., Amos, T., Singh, S., Sharma, V., Freemantle, N., Fowler, D., 2015. Investigating trajectories of social recovery in individuals with first-episode psychosis: A latent class growth analysis. *Br. J. Psychiatry* 207, 536–543. <https://doi.org/10.1192/bjp.bp.114.153486>
- Jones, N., Godzikovskaya, J., Zhao, Z., Vasquez, A., Gilbert, A., Davidson, L., 2017. Intersecting disadvantage: Unpacking poor outcomes within early intervention in psychosis services. *Early Interv. Psychiatry* 13, 488–494. <https://doi.org/10.1111/eip.12508>
- Keating, F., Robertson, D., McCulloch, A., Francis, E., 2002. *Breaking the circles of fear: a review of the relationship between mental health services and African and Caribbean communities.* London.
- Koutsouleris, N., 2019. Toward clinically useful models for individualised prognostication in psychosis. *Lancet Digit. Heal.* 1, e244–e245. [https://doi.org/10.1016/S2589-7500\(19\)30122-0](https://doi.org/10.1016/S2589-7500(19)30122-0)
- Lecomte, T., Spidel, A., Leclerc, C., MacEwan, G.W., Greaves, C., Bentall, R.P., 2008. Predictors and profiles of treatment non-adherence and engagement in services problems in early psychosis. *Schizophr. Res.* 102, 295–302. <https://doi.org/10.1016/j.schres.2008.01.024>
- McCrone, P., Craig, T.K.J., Power, P., Garety, P.A., 2010. Cost-effectiveness of an early intervention service for people with psychosis. *Br. J. Psychiatry* 196, 377–382. <https://doi.org/10.1192/bjp.bp.109.065896>
- Muthén, L K Muthén, B.O., 2017. *Mplus User's Guide.* Eighth Edition. Los Angeles, CA.
- National Institute for Health and Care Excellence., 2020. *Rehabilitation for adults with complex psychosis [ng181].*

- National Institute for Health and Care Excellence., 2015. Bipolar disorder, psychosis and schizophrenia in children and young people, Quality standard [QS102].
- Nordentoft, M., Rasmussen, J.Ø., Melau, M., Hjorthøj, C.R., Thorup, A.A.E., 2014. How successful are first episode programs? A review of the evidence for specialized assertive early intervention. *Curr. Opin. Psychiatry* 27, 167–172. <https://doi.org/10.1097/YCO.0000000000000052>
- O'Driscoll, C., Free, K., Attard, A., Carter, P., Mason, J., Shaikh, M., 2019. Transitioning to age inclusive early intervention for psychosis. *Early Interv. Psychiatry* eip.12905. <https://doi.org/10.1111/eip.12905>
- Oduola, S., Craig, T.K.J., Das-Munshi, J., Bourque, F., Gayer-Anderson, C., Morgan, C., 2019. Compulsory admission at first presentation to services for psychosis: does ethnicity still matter? Findings from two population-based studies of first episode psychosis. *Soc. Psychiatry Psychiatr. Epidemiol.* 54, 871–881. <https://doi.org/10.1007/s00127-019-01685-y>
- Osimo, E.F., Perry, B.I., Cardinal, R.N., Lynall, M.-E., Lewis, J., Kudchadkar, A., Murray, G.K., Perez, J., Jones, P.B., Khandaker, G.M., 2020. Inflammatory and cardiometabolic markers at presentation with first episode psychosis and long-term clinical outcomes: A longitudinal study using electronic health records. *Brain. Behav. Immun.* <https://doi.org/10.1016/j.bbi.2020.09.011>
- Pelayo-Terán, J.M., Gajardo Galán, V.G., de la Ortiz-García de la Foz, V., Martínez-García, O., Tabarés-Seisdedos, R., Crespo-Facorro, B., Ayesa-Arriola, R., 2017. Rates and predictors of relapse in first-episode non-affective psychosis: a 3-year longitudinal study in a specialized intervention program (PAFIP). *Eur. Arch. Psychiatry Clin. Neurosci.* 267, 315–323. <https://doi.org/10.1007/s00406-016-0740-3>
- Puntis, S., Oke, J., Lennox, B., 2018. Discharge pathways and relapse following treatment from early intervention in psychosis services. *BJPsych Open* 4, 368–374. <https://doi.org/10.1192/bjo.2018.50>
- Radhakrishnan, M., McCrone, P., Lafortune, L., Everard, L., Fowler, D., Amos, T., Freemantle, N., Singh, S.P., Marshall, M., Sharma, V., Lavis, A., Jones, P.B., Birchwood, M., 2018. Cost-effectiveness of early intervention services for psychosis and fidelity to national policy implementation guidance. *Early Interv. Psychiatry* 12, 747–756. <https://doi.org/10.1111/eip.12481>
- Rammou, A., Fisher, H.L., Johnson, S., Major, B., Rahaman, N., Chamberlain-Kent, N., Stone, J.M., 2019. Negative symptoms in first-episode psychosis: Clinical correlates and 1-year follow-up outcomes in London Early Intervention Services. *Early Interv. Psychiatry* 13, 443–452. <https://doi.org/10.1111/eip.12502>
- Saunders, R., Buckman, J.E.J., Pilling, S., 2020. Latent variable mixture modelling and individual treatment prediction. *Behav. Res. Ther.* 124, 103505. <https://doi.org/10.1016/j.brat.2019.103505>
- Savill, M., Orfanos, S., Reininghaus, U., Wykes, T., Bentall, R., Priebe, S., 2016. The relationship between experiential deficits of negative symptoms and subjective quality of life in schizophrenia. *Schizophr. Res.* 176, 387–391. <https://doi.org/10.1016/j.schres.2016.06.017>
- Schoer, N., Huang, C.W., Anderson, K.K., 2019. Differences in duration of untreated psychosis for racial and ethnic minority groups with first-episode psychosis: an updated systematic review and meta-analysis. *Soc. Psychiatry Psychiatr. Epidemiol.* 54, 1295–1298. <https://doi.org/10.1007/s00127-019-01737-3>

- Scrucca, L., Fop, M., Murphy, T.B., Raftery, A.E., 2016. mclust 5: Clustering, Classification and Density Estimation Using Gaussian Finite Mixture Models. *R J.* 8, 289–317.
- van der Ven, E., Scodes, J., Basaraba, C., Pauselli, L., Mascayano, F., Nossel, I., Bello, I., Humensky, J., Susser, E., Wall, M., Dixon, L., 2020. Trajectories of occupational and social functioning in people with recent-onset non-affective psychosis enrolled in specialized early intervention services across New York state. *Schizophr. Res.* <https://doi.org/10.1016/j.schres.2020.05.051>
- Wing, J.K., Beevor, A.S., Curtis, R.H., Park, S.G.B., Hadden, J., Burns, A., 1998. Health of the Nation Outcome Scales (HoNOS). *Br. J. Psychiatry* 172, 11–18. <https://doi.org/10.1192/bjp.172.1.11>
- World Health Organization., 1993. The ICD-10 classification of mental and behavioural disorders: diagnostic criteria for research (Vol. 2). World Health Organization.
- Zipursky, R.B., Menezes, N.M., Streiner, D.L., 2014. Risk of symptom recurrence with medication discontinuation in first-episode psychosis: A systematic review. *Schizophr. Res.* 152, 408–414. <https://doi.org/10.1016/j.schres.2013.08.001>

Appendices

	Profile membership					Total (N=2340)	p
	1 (n=366)	2 (n=121)	3 (n=322)	4 (n=243)	5 (n=1310)		
Ethnicity							< 0.001
Asian or Asian	44				106		
British - Other	(12.1%)	5 (4.1%)	26 (8.1%)	22 (9.1%)	(8.2%)	203 (8.7%)	
Indian/ British	42	12	45		111		
Indian	(11.6%)	(9.9%)	(14.0%)	20 (8.2%)	(8.6%)	230 (9.8%)	
Pakistani /	10						
British Pakistani	(2.8%)	5 (4.1%)	14 (4.4%)	11 (4.5%)	55 (4.3%)	95 (4.1%)	
	25						
Biracial	(6.9%)	8 (6.6%)	20 (6.2%)	12 (4.9%)	49 (3.8%)	114 (4.9%)	
Black or Black	24						
British - Other	(6.6%)	9 (7.4%)	18 (5.6%)	24 (9.9%)	62 (4.8%)	137 (5.9%)	
Black African or	46	27	57	44	133		
British African	(12.7%)	(22.3%)	(17.8%)	(18.1%)	(10.3%)	307 (13.1%)	
Black Caribbean							
/	14						
British Caribbean	(3.9%)	4 (3.3%)	15 (4.7%)	12 (4.9%)	52 (4.0%)	97 (4.1%)	
Not known	0 (0.0%)	0 (0.0%)	2 (0.6%)	0 (0.0%)	50 (3.9%)	52 (2.2%)	
	13						
Middle Eastern	(3.6%)	3 (2.5%)	11 (3.4%)	6 (2.5%)	53 (4.1%)	86 (3.7%)	
	21				120		
Other	(5.8%)	5 (4.1%)	21 (6.5%)	16 (6.6%)	(9.3%)	183 (7.8%)	
	81	35	62	47	338		
White - British	(22.3%)	(28.9%)	(19.3%)	(19.3%)	(26.2%)	563 (24.1%)	
	28						
White - European	(7.7%)	2 (1.7%)	22 (6.9%)	19 (7.8%)	98 (7.6%)	169 (7.2%)	
	15						
White - Other	(4.1%)	6 (5.0%)	8 (2.5%)	10 (4.1%)	65 (5.0%)	104 (4.4%)	
Gender							< 0.001
	162	35	118	67	485		
Female	(44.6%)	(28.9%)	(36.8%)	(27.6%)	(37.5%)	867 (37.1%)	
	201	86	203	176	807	1473	
Male	(55.4%)	(71.1%)	(63.2%)	(72.4%)	(62.5%)	(62.9%)	
Age							0.008
Mean (SD)	24.4 (4.9)	23.5 (4.8)	23.9 (4.9)	23.3 (5.5)	24.4 (5.1)	24.2 (5.1)	
HoNOS							<
(1) Aggression	1.0 (1.3)	1.2 (1.2)	1.2 (1.3)	1.2 (1.4)	0.7 (1.1)	0.9 (1.2)	0.001
N	216	80	219	175	760	1428	
(2) Self-harm	0.4 (0.9)	0.3 (0.8)	0.5 (1.0)	0.4 (0.9)	0.3 (0.8)	0.4 (0.9)	0.236
N	212	77	215	171	756	1409	
(3) substance use	0.7 (1.2)	1.1 (1.4)	1.0 (1.3)	0.9 (1.3)	0.7 (1.1)	0.8 (1.2)	0.001
N	216	81	218	172	761	1426	
(4) Cognition	0.6 (1.0)	0.9 (1.1)	0.7 (1.0)	0.9 (1.2)	0.5 (0.9)	0.6 (1.0)	< 0.001
N	214	79	219	171	754	1415	
(5) Physical health	0.4 (0.9)	0.3 (0.6)	0.3 (0.7)	0.2 (0.7)	0.4 (0.8)	0.3 (0.8)	0.195
N	214	76	213	173	756	1410	
(6) Affective disorders	1.6 (1.4)	1.6 (1.3)	1.8 (1.4)	1.9 (1.3)	1.4 (1.3)	1.6 (1.3)	< 0.001
N	216	81	220	175	765	1435	
(7) Psychotic disorders	1.4 (1.2)	1.1 (1.1)	1.2 (1.2)	1.2 (1.2)	1.3 (1.2)	1.3 (1.2)	0.454

N	214	79	219	174	766	1430	
(8) Other symptoms	1.6 (1.3)	1.4 (1.3)	1.6 (1.3)	1.7 (1.3)	1.5 (1.3)	1.5 (1.3)	0.102
N	206	74	200	154	712	1324	
(9) Social relations	1.4 (1.2)	1.2 (1.2)	1.3 (1.2)	1.3 (1.3)	1.2 (1.2)	1.3 (1.2)	0.288
N	216	80	218	171	770	1433	
(10) General functioning	1.0 (1.1)	1.0 (1.1)	0.9 (1.1)	1.1 (1.2)	0.8 (1.1)	0.9 (1.1)	0.049
N	217	81	219	173	769	1437	
(11) Housing	0.8 (1.2)	0.7 (1.1)	0.8 (1.2)	0.8 (1.2)	0.7 (1.1)	0.7 (1.2)	0.858
N	213	78	217	169	767	1422	
(12) Activities	1.4 (1.2)	1.3 (1.2)	1.4 (1.3)	1.5 (1.2)	1.3 (1.2)	1.4 (1.2)	0.415
N	214	79	218	170	770	1429	
Behaviour subscale	2.2 (2.3)	2.6 (2.3)	2.6 (2.5)	2.4 (2.3)	1.7 (2.1)	2.0 (2.3)	< 0.001
N	212	77	212	169	746	1394	
Impairment subscale	0.9 (1.5)	1.1 (1.4)	0.9 (1.4)	1.2 (1.4)	0.9 (1.3)	1.0 (1.4)	0.147
N	212	76	212	170	745	1393	
Symptom subscale	4.6 (2.7)	4.1 (2.6)	4.7 (2.8)	4.8 (2.6)	4.2 (2.6)	4.4 (2.7)	0.032
N	203	72	197	153	701	1304	
Social subscale	4.6 (3.5)	4.3 (3.1)	4.5 (3.5)	4.7 (3.4)	4.1 (3.4)	4.3 (3.4)	0.114
N	210	77	213	166	753	1397	
HoNOS total	12.1 (6.8)	11.8 (6.7)	12.9 (7.3)	13.1 (6.6)	11 (6.9)	11.7 (6.9)	<0.001
N	191	63	186	147	655	1242	1

Table A.1: Demographic and HONOS summary day by profile and whole profile.

		b	OR	p<
HoNOS				
total	1	2.31	1.03	0.02*
	2	1.44	1.03	0.15
	3	3.56	1.04	0.01*
	4	3.00	1.04	0.01*

Table A.2: Model: Profile predicted by HoNOS total controlling for age and gender. Profile 5 is the reference.

		b	OR	p<
HoNOSA	1	1.98	1.08	0.05*
	2	3.06	1.21	0.00*
	3	3.68	1.16	0.00*
	4	1.27	1.06	0.20
HoNOSB	1	-0.59	0.96	0.55
	2	1.29	1.14	0.20
	3	-0.19	0.99	0.85
	4	1.94	1.14	0.05*
HoNOSC	1	0.55	1.02	0.59
	2	-1.96	0.89	0.05*
	3	0.30	1.01	0.76
	4	1.06	1.04	0.29
HoNOSD	1	0.68	1.02	0.49
	2	-0.30	0.99	0.76
	3	0.55	1.02	0.58
	4	0.24	1.01	0.81

Table A.3: Model: Profile predicted by HoNOS subscales controlling for age and gender. Profile 5 is the reference.

		B	OR	p<		B	OR	p<	
Aggression	1	2.19	1.20	0.03*	Other symptoms	1	0.21	1.02	0.84
	2	1.25	1.18	0.21		2	-1.94	0.79	0.05*
	3	2.38	1.21	0.02*		3	0.15	1.01	0.88
	4	0.93	1.09	0.35		4	0.78	1.07	0.43
Self-harm	1	1.26	1.13	0.21	Social relations	1	0.61	1.05	0.54
	2	-0.62	0.89	0.53		2	-0.71	0.91	0.48
	3	1.38	1.15	0.17		3	0.01	1.00	0.99
	4	0.39	1.05	0.70		4	-0.80	0.93	0.42
Substance use	1	-0.81	0.94	0.42	General functioning	1	1.65	1.16	0.10
	2	2.96	1.39	0.01*		2	0.84	1.13	0.40
	3	0.92	1.07	0.36		3	0.14	1.01	0.89
	4	-0.15	0.99	0.88		4	0.51	1.05	0.61
Cognition	1	-0.78	0.93	0.44	Housing	1	0.04	1.00	0.97
	2	2.18	1.36	0.03*		2	0.07	1.01	0.95
	3	0.93	1.09	0.35		3	1.00	1.08	0.31
	4	3.60	1.41	0.01*		4	1.10	1.10	0.27
Physical health	1	-0.44	0.96	0.66	Activities	1	-1.18	0.91	0.24
	2	-0.83	0.86	0.41		2	-0.80	0.90	0.43
	3	-1.58	0.83	0.11		3	-0.03	1.00	0.98
	4	-1.87	0.78	0.06		4	-0.38	0.97	0.71
Hallucination & delusion	1	0.74	1.05	0.46					
	2	0.00	1.00	1.00					
	3	2.00	1.15	0.05*					
	4	2.05	1.17	0.04*					
Depression	1	-0.64	0.95	0.52					
	2	-0.61	0.92	0.54					
	3	-1.81	0.86	0.07					
	4	-1.52	0.87	0.13					

Table A.4: Model: Profile predicted by HoNOS individual items controlling for age and gender. Profile 5 is the reference.

		B	OR	p<
Age	1	-0.41	1.00	0.68
	2	-1.81	0.96	0.07
	3	-1.56	0.98	0.12
	4	-2.91	0.96	0.01*
Gender (Male)	1	-2.47	0.74	0.01*
	2	1.73	1.44	0.08
	3	0.13	1.02	0.89
	4	2.73	1.53	0.01*

Table A.5: Model: Profile predicted by age and gender only. Profile 5 is the reference.

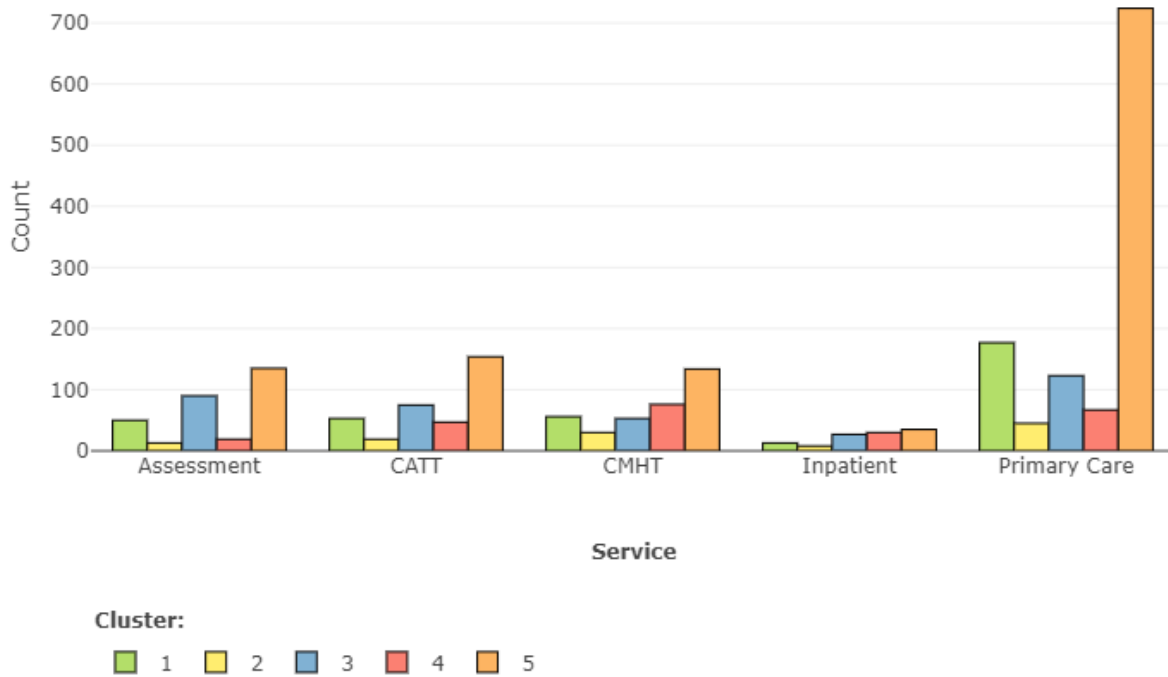


Figure A.1: Barchart displaying the proportion of service referred onto after EIS (and after 3 years) by profile.

	1	2	3	4	5	Total
Assessment	50 (16.3)	13 (4.2)	90 (29.3)	19 (6.2)	135 (44.0)	307 (100)
CATT	53 (15.2)	19 (5.5)	75 (21.6)	47 (13.5)	154 (44.3)	348 (100)
CMHT	56 (16.0)	30 (8.6)	53 (15.2)	76 (21.8)	134 (38.4)	349 (100)
Inpatient	13 (11.5)	8 (7.1)	27 (23.9)	30 (26.5)	35 (31.0)	113 (100)
Primary Care	177 (15.6)	45 (4.0)	123 (10.8)	67 (5.9)	724 (63.7)	1136 (100)
Overall	349 (15.5)	115 (5.1)	368 (16.3)	239 (10.6)	1182 (52.5)	2253 (100)

Table A.6: Observed Contingency Table with Conditional Distribution (in %) reflecting data in Figure

Service	N	Days in service over 3 years (M)	SD	min – max
Asian or Asian British – Other				
CATT	203	20.86	36.70	0 - 253
EIS	203	683.94*	450.69	15 – 1095
Inpatient	203	29.64	107.87	0 – 849
Indian/ British Indian				
CATT	230	23.68	36.87	0 -206
EIS	230	689.09*	436.66	15-1095
Inpatient	230	33.23	100.60	0 -747
Pakistani / British Pakistani				
CATT	95	18.00	35.58	0 - 182
EIS	95	688.91*	435.55	15 -1095
Inpatient	95	24.23	86.99	0 - 760
Biracial				
CATT	114	31.65*	51.12	0 - 280
EIS	114	686.80*	444.97	15 - 1095
Inpatient	114	44.07*	115.33	0 - 721
Black or Black British				
CATT	137	25.12	42.14	0 - 304
EIS	137	702.15*	424.78	35 - 1095
Inpatient	137	57.95*	126.42	0 - 621
Black or Black British – African				
CATT	307	25.17*	40.08	0 – 209
EIS	307	703.99*	422.87	15 - 1095
Inpatient	307	62.04*	142.53	0 - 964
Black or Black British – Caribbean				
CATT	97	19.99	31.93	0 - 129
EIS	97	686.14*	428.23	15 - 1095
Inpatient	97	41.94	105.10	0 - 772
Not known				
CATT	52	1.79	12.08	0 - 87
EIS	52	247.13	272.29	18 - 1095
Inpatient	52	0.73	4.28	0 - 30
Middle Eastern				
CATT	86	17.78	29.55	0 - 145
EIS	86	709.26*	422.88	15 – 1095
Inpatient	86	32.30	99.49	0 - 650
Other Ethnic Group				
CATT	183	13.61	26.82	0 – 149
EIS	183	574.88	423.95	16 – 1095
Inpatient	183	20.26	61.81	0 - 559

White British				
CATT	563	17.59	34.81	0 – 240
EIS	563	548.52	442.41	15 – 1095
Inpatient	563	25.92	78.30	0 - 768
White – European				
CATT	169	20.60	38.19	0 – 204
EIS	169	593.11	439.07	15 – 1095
Inpatient	169	28.19	93.67	0 - 873
White – Other				
CATT	104	19.07	39.59	0 – 268
EIS	104	501.09	449.37	21 – 1095
Inpatient	104	25.53	74.53	0 - 587

Table A.7: Use of services by ethnicity group. *statistically significantly more days than White

British group Asian or Asian British, $t(425)=3.69$, $p < 0.001$;

Indian/ British Indian, $t(430)=4.10$, $p < 0.001$;

Pakistani / British Pakistani, $t(403)= 2.90$, $p < 0.007$;

Biracial, $t(406)=3.03$, $p < 0.005$;

Black or Black British, $t(409)= 3.77$, $p < 0.001$;

Black African/ British African, $t(868)=4.99$, $p < 0.001$;

Black Caribbean/ British Caribbean, $t(658)=2.84$. $p < 0.001$;

Middle Eastern, $t(658)=3.32$, $p < 0.001$

CATT

Biracial $t(406)=2.80$, $p < 0.01$

Black African/ British African, $t(452)=2.79$, $p < 0.01$

Inpatient

Biracial $t(675)=2.06$, $p < 0.03$;

Black or Black British, $t(698)=3.74$, $p < 0.001$;

Black African/ British African, $t(868)= 4.83$, $p < 0.001$

	Profile	b	OR	p
Asian or Asian British – Other	1	2.43	1.70	0.015
	2	-1.47	0.49	0.141
	3	1.23	1.38	0.219
	4	1.73	1.63	0.084
Indian/ British Indian	1	2.06	1.58	0.040
	2	0.33	1.12	0.744
	3	3.72	2.32	0.000
	4	1.27	1.45	0.206
Pakistani / British Pakistani	1	-0.72	0.77	0.471
	2	-0.21	0.90	0.832
	3	1.08	1.43	0.282
	4	1.10	1.50	0.270
Biracial	1	2.59	2.04	0.010
	2	1.19	1.65	0.233
	3	2.67	2.23	0.008
	4	1.73	1.86	0.084
Black or Black British – Other	1	1.64	1.56	0.102
	2	1.10	1.56	0.271
	3	1.66	1.65	0.097
	4	4.02	3.21	0.000
Black African/ British African	1	1.67	1.42	0.095
	2	2.65	2.09	0.008
	3	4.17	2.41	0.000
	4	4.05	2.60	0.000
Black Caribbean/ British Caribbean	1	0.38	1.13	0.707
	2	-0.44	0.78	0.659
	3	1.53	1.64	0.127
	4	1.64	1.80	0.100
Not known	1	--	0.00	0.000
	2	--	0.00	0.000
	3	-2.03	0.23	0.043
	4	--	0.00	0.000
Middle Eastern	1	0.07	1.02	0.945
	2	-0.88	0.58	0.379
	3	0.45	1.18	0.652
	4	-0.25	0.89	0.802
Other Ethnic Group	1	-1.14	0.74	0.256
	2	-1.76	0.42	0.079
	3	-0.03	0.99	0.979
	4	0.11	1.04	0.911
White - European	1	0.61	1.17	0.540
	2	-2.03	0.22	0.043
	3	0.98	1.31	0.327
	4	1.71	1.67	0.088
White - Other	1	-0.19	0.94	0.848
	2	-0.04	0.98	0.972

3	-0.87	0.71	0.384
4	0.64	1.27	0.525

Table A.8: Odds of Profile inclusions by ethnicity controlling for age and gender. Profile 5 is the reference.