

## Research Article

# A multi-site randomised controlled trial of evidence-based supported employment for adults with severe and persistent mental illness

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**Background/aim:** The Individual Placement and Support (IPS) approach is an evidence-based form of supported employment for people with severe and persistent mental illness. This approach is not yet widely available in Australia even though there is mounting evidence of its generalisability outside the USA. One previous Australian randomised controlled trial found that IPS is effective for young people with first episode psychosis. The aim of the current trial was to assess the effectiveness of evidence-based supported employment when implemented for Australian adult consumers of public mental health services by utilising existing service systems.

**Methods:** A four-site randomised control trial design (n = 208) was conducted in Brisbane (two sites), Townsville and Cairns. The intervention consisted of an IPS supported employment service hosted by a community mental health team. The control condition was delivered at each site by mental health teams referring consumers to other disability employment services in the local area.

**Results:** At 12 months, those in the IPS condition had 2.4 times greater odds of commencing employment than those in the control condition (42.5% vs. 23.5%). The conditions did not differ on secondary employment outcomes including job duration, hours worked, or job diver-

sity. Attrition was higher than expected in both conditions with 28.4% completing the baseline interview but taking no further part in the study.

**Conclusion:** The results support previous international findings that IPS-supported employment is more effective than non-integrated supported employment. IPS can be successfully implemented this way in Australia, but with a loss of effect strength compared to previous USA trials.

**KEY WORDS** employment, psychosis, schizophrenia, severe and persistent mental illness, supported employment.

## Introduction

Severe and persistent mental illness (SPMI) can cause lifelong unemployment, social isolation, and social and economic marginalisation (Bond & Drake, 2014; Waghorn & Lloyd, 2005). A recent report has highlighted this issue as a target for continuing reform in Australia (Carr & Waghorn, 2013). In a post-deinstitutionalisation era, it is not enough to provide effective mental health treatment and continuing care because, even if treatment is successful, few go on to attain their vocational goals. The evidence for this is revealed in the national surveys of psychosis (Waghorn, Saha *et al.*, 2012) where only 22% of adult community residents with psychotic disorders were employed in the past four weeks. This is the complement of the proportion typically employed (70–80%) among healthy working age Australians (Waghorn *et al.*, 2004), and shows that future Australian mental health reform can and should include evidence-based forms of vocational rehabilitation (Carr & Waghorn; Harvey *et al.*, 2013).

Much is known about what can be done to improve competitive employment among people with SPMI. The most effective and specialised of the vocational interventions available is the Becker-Drake Individual Place-

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ment and Support (IPS) approach to supported employment (Bond, 2004; Bond, Drake & Becker, 2008; Burns *et al.*, 2007; Cook *et al.*, 2005; Hoffmann *et al.*, 2012; Kinoshita *et al.*, 2013). This approach is designed specifically for people with SPMI who are currently or recently treated by public mental health services. There is evidence that IPS can be effectively implemented outside the USA with no reduction in effectiveness compared to USA controlled trials (Bond, Drake & Becker, 2012). Successful implementations in Australia (Killackey, Jackson & McGorry, 2008; Waghorn, Childs *et al.*, 2012) and IPS enhancements in New Zealand (Browne *et al.*, 2009) show that it can be replicated. However, it is not clear yet whether it can be implemented successfully within existing service delivery systems. This is important because if this is feasible, recurrent case-based funding is already available under the Australian Government's Disability Employment Service programme (Department of Education, Employment and Workplace Relations, 2012). This in turn can provide stability and sustainability to an IPS intervention provided its evidence-based practices can be sufficiently established within the constraints of mental health services and disability employment policy settings (Waghorn, Collister, *et al.*, 2007).

One way to implement IPS in Australia, in a way which utilises existing service systems, involves developing formal partnerships. In this approach, consumers of public funded mental health services are offered assistance from a disability employment service co-located into the premises of the mental health service (Morris *et al.*, in press). This is a different implementation approach to that previously reported (Killackey *et al.*, 2008), and is achieved by establishing an evidence-based supported employment programme within a community mental health service (Morris *et al.*; Waghorn, Childs *et al.*, 2012). The main challenge to this approach is attaining high fidelity to IPS principles (Bond, Peterson *et al.*, 2012; Sherring *et al.*, 2010). This is because organisational culture, policies, and practices of both agencies may need to change. For most organisations, such change is difficult and often dependant on inter-agency cooperation. Hence, it is expected that the rate of adoption of evidence-based practices will vary across agencies and locations.

One Australian randomised controlled trial (Killackey *et al.*, 2008) showed that IPS can be implemented to high fidelity by directly employing an employment specialist to join a youth mental health team. The results show that IPS, implemented in this manner, significantly improved vocational outcomes for young adults with first episode psychosis, over mental health treatment as usual. However, the strength of those effects may not generalise to adults with SPMI, nor to mental health service consumers with chronic psychotic disorders. Nor is it likely that the same strength of effect will emerge from a partnership approach, where the practices of the employment specialist are not under the

direct influence of the mental health service (Sherring *et al.*, 2010; Waghorn, Childs, *et al.*, 2012). In addition, the disability employment service partner has contractual obligations to the Australian Government in return for recurrent case-based funding. This can conflict with IPS evidence-based practices (Carr & Waghorn, 2013).

This investigation aimed to assess these aspects of generalizability of IPS to Australia through the use of a four-site randomised controlled trial design. This trial compared IPS to non-integrated forms of supported employment. This represents an enhancement over previous trials of IPS where the control group often included traditional vocational rehabilitation and 'train and place' vocational services (Bond, 2004; Bond *et al.*, 2008; Kinoshita *et al.*, 2013).

## Methods

This investigation utilised a multicentre, parallel group, randomised controlled trial of evidence-based supported employment (Bond & Drake, 2014; Waghorn, Childs, *et al.*, 2012). Implementation of the intervention condition at each site was based on a formal partnership approach which links a community mental health service to an Australian Government funded disability employment service. Staged implementation followed a common basic plan. Funding was offered to the first six volunteering sites, in the form of a non-recurrent \$AU75000, per site, in the first year and \$AU50,000 in the second year, to reimburse the costs of establishing formal partnership agreements between the participating mental health services and the disability employment service. The trial involved four other sites which did not use a randomised controlled design and those results are reported separately.

### Site recruitment

Expressions of interest were sought in the first quarter of 2007. Each participating site was required to form a local steering group, identify a site coordinator, and indicate acceptance of a randomised controlled trial design. Five sites initially met these criteria: the Gold Coast Mental Health Service, the Princess Alexandra Hospital Mental Health Service, West Moreton Mental Health Service, Townsville Mental Health Service, and Cairns Mental Health Service.

### Participant recruitment

The same participant inclusion criteria were applied at each site. To be eligible individual volunteers needed to (i) have expressed interest in competitive employment as a goal; (ii) be currently available to work for eight hours or more per week; (iii) not be currently employed and not employed within the previous three months; (iv) be diagnosed with a psychotic disorder; (v) be an Australian resident aged between 18 and 59 years; (vi) be a consumer of the mental health service at time of

referral; (vii) not be in an acute phase of illness; (viii) be living in the mental health service catchment area with no immediate plans to move; and (ix) be considered by the clinical team to be able to safely participate in the programme. For forensic volunteers at West Moreton, an additional requirement was that permission to leave the high-secure and medium-secure units could be sought from the Mental Health Review Tribunal.

The recruitment strategy began at each site with presentations to mental health clinicians and case managers who were asked to identify potential participants and refer them to the project. At the first meeting with interested volunteers, the research officer appointed to each site provided a full description of the study prior to seeking written informed consent. Ethical approval was obtained at each site from the respective hospital-based human research ethics committee.

Each participant completed the baseline interview protocol before being randomly allocated to the IPS intervention condition, or to an equivalent local disability employment service not co-located with the mental health team (control service). Simple randomisation was conducted centrally for all sites, at an individual level to a 1:1 allocation ratio, using a purpose designed MS-Access randomisation algorithm. Recruitment took place between 1 July 2008 and 30 June 2009, with follow-up completed on 30 June 2010 at all sites.

### The intervention condition

The intervention was governed by a standardised service level agreement between two agencies that enabled a full-time employment specialist employed by the employment service, to be co-located into the mental health team as the sole person delivering the employment service to volunteer consenting consumers of the mental health service. All four employment service partners in the intervention condition were contracted to the Australian Government and all received recurrent case-based funding once each individual's employment programme eligibility was determined.

The employment specialist was typically co-located at the mental health service four of five days per week. Co-location enabled daily informal contact with mental health case managers, clinicians and shared consumers. Contact with the parent employment service was encouraged to maintain specialist knowledge, contract knowledge, peer support, supervision, and access to parent service generated job leads.

### The control condition

Mental health case managers were given responsibility for delivering the control condition as part of enhanced routine mental health case management. They were provided assistance to engage with the most effective alternative disability employment services in the local area. They were provided with a resource guide (Waghorn *et al.*, 2011) supported by initial training to locate and

select suitable employment services. Regular communication with the employment specialist was then encouraged to facilitate client engagement and to monitor referral progress. At two sites (Townsville and Cairns), there were no other disability employment services willing to accept referrals from the mental health teams, so staff of the same employment service but not co-located with the mental health team, provided the control service. This was an enhancement to usual mental health services because in Queensland, mental health service case managers are not required to refer consumers to disability employment services. Employment services accepting these referrals had the same service contracts with the Australian Government and were subject to the same standards and reporting requirements as the employment services in the intervention condition.

### Implementation plan

The implementation plan for both conditions at each site involved a member of the project team: (i) providing assistance to the mental health team to identify disability employment services in the local area; (ii) sending information to those employment services inviting them to a presentation on evidence-based practices; (iii) presenting information to staff of both services on evidence-based practices, the roles of all staff involved, and a discussion of implementation issues previously encountered; (iv) a discussion of how to establish and maintain a formal partnership; and (v) distribution of information resources to facilitate the establishment formal partnerships. This included information about resources available from Dartmouth Psychiatric Rehabilitation Center, and Australia-specific resources and training materials (Waghorn *et al.*, 2011). Training also covered how to form collaborations with, and make referrals to, local disability employment services not involved in the formal partnerships.

The Gold Coast Mental Health Service volunteered for the randomised design, yet did not succeed in implementation. Neither a full-time co-located employment specialist nor a local steering group, were established. Consequently, only fair fidelity was achieved with respect to IPS practices (Bond *et al.*, 1997). Data collection was discontinued after six months because the arrangements resembled an informal collaboration more than a formal partnership. Data from the GC site were excluded from this analysis. Details of the implementation challenges experienced at each site are described elsewhere (Waghorn, Childs, *et al.*, 2012).

### Site training and support

Each site received an initial three hours training in evidence-based practices in supported employment designed for employment service and mental health staff. However, training was not mandatory and not all staff attended. Most employment services accepted some information or training in IPS practices, but some

did not consider training necessary because they considered they were already using these practices.

To encourage the development of IPS practices, each employment specialist was also offered individual training in person or by telephone, with a copy of the IPS fidelity scale and manual for the 15 item version (Bond *et al.*, 1997), and shown how to make self assessments of their practice fidelity via item-level discussions by telephone with one member of the investigating team.

Following this initial training, fidelity self assessments were gathered every six months from each site using the 15-item scale. Each employment specialist reported their outcomes monthly by way of a case-list snapshot report, which also served as a validity check on several items from the fidelity scale. A state-wide coordination group was established from representatives of each site to support and monitor the initiative, support established sites, and to encourage further expansion of the programme throughout the state. Information was shared among sites about how to solve local problems. Remote sites linked in by teleconference. This group met quarterly throughout the project.

### Fidelity measures

Employment service adherence to IPS practices was assessed by the 15-item IPS fidelity scale (Bond *et al.*, 1997). These were conducted every six months, by telephone or in person, as a guided self assessment completed by discussing the employment specialist's self assessment of each item, and the justification for each self-assessed score. External evidence was considered when available, such as monthly case-progress summaries, the views of employment service supervisors, and the views of clinical team members and site coordinators. In the control condition, the measure was initially completed by the employment specialist supervisor, and reviewed by telephone for justification and to consider any restrictions on IPS practices imposed by the collaborating service.

### Masking and allegiance effects

Due to the visible nature of the employment services being provided, it was not possible to mask the results of randomisation. We attempted to manage allegiance effects (Mohr *et al.*, 2009) as a possible threat to internal validity, in several ways. The intervention condition was expected to be favoured by some participants, because this was previously observed in a pilot study at West Moreton (Waghorn, Childs, *et al.*, 2012).

Some participating mental health teams were concerned about the randomisation design and insisted that the study protocol include a strategy to manage any refusals among those allocated to the control condition. It was agreed that any participants who objected to their control condition randomisation would be offered the opportunity of transferring to the intervention after

a minimum of six months' assignment to the control employment service, provided they were still dissatisfied at that time and wished to make the transfer. This compromise represented a planned protocol deviation (contamination) to an intention-to-treat model (ITT, Gupta, 2011). This trade-off was necessary to keep the concerned mental health teams positively engaged with the project. Subsequently, 28 participants originally allocated to the control service opted to transfer to the IPS intervention after six months. The contaminated results were retained in the control group as originally allocated, consistent with an ITT approach, but these results were also analysed separately. Allegiance effects were further managed by keeping staff and participants blind to the results being achieved. This was managed by delaying all forms of analysis and reporting until after July 2010 when the last wave of data collection was completed.

### Participant measures

Structured interviews of mean duration of one hour were conducted in private at each mental health service or occasionally at the participant's home when requested. Participants were interviewed at three time points, at commencement (baseline), six and 12 months. The structured interview incorporated the following standardised measures: Socially-Valued Role Classification Scale (Waghorn, Chant & King, 2007); Scale for the Assessment of Positive Symptoms (Andreasen, 1984); and the Scale for the Assessment of Negative Symptoms (Andreasen, 1982). DSM-IV diagnostic classification was provided by the mental health team. Other demographic information gathered included age, sex, partner status, language spoken at home, highest education attainment, details of previous and current employment, and current place of residence.

### Primary and secondary outcomes

The primary employment outcome was one or more days of competitive employment in the previous 6 and 12 months. This is defined according to IPS principles, as jobs in the open labour market at award wages or above, and not temporary jobs, piece work, voluntary work, or unpaid work experience, and not jobs reserved for people with disabilities.

A co-primary vocational outcome was 'any vocational benefit'. This was defined as either commencement of competitive employment, or commencement of formal education or training (defined as enrolment in a formal education course or in a vocational training course leading to recognised qualifications). Secondary outcomes included job duration in weeks, hours worked per week, earnings, and job diversity. The latter was measured by counting the number of standardised classifications of occupations represented in comparison to the total number of jobs reported (Australian Bureau of Statistics, 1997).



## Power and sample size

The minimum sample size required was calculated on the basis of the following: (i) that the intervention effect would be 20% greater than the control group in terms of the primary employment outcome (50% vs. 30%); (ii) Type I error of 5% (95% confidence level); and (iii) Type II error of 20% (80% Power). This resulted in a sample size estimate of 100 participants required in each of the intervention and control groups (Power = 82.8%). Power was not sufficient (less than 80%) for comparisons between sites. Hence, the focus of reporting was on results aggregated within intervention and control conditions.

## Statistical methods

Differences in participant characteristics were examined at baseline by intervention allocation group, to check the effects of randomisation. Those lost to follow-up after completing only a baseline interview, were compared to those who completed a second interview at either 6 or 12 months. Differences between intervention and control conditions were assessed in terms of the primary and secondary outcomes, namely the proportions that commenced competitive employment, or attained a vocational benefit during the 12 month follow-up period. Statistical significance of differences between proportions was assessed in STATA version 11 (Stata Corp, College Station, TX, USA), by the Wald chi-square statistic, using odds ratios and confidence inter-

vals. Differences between means were assessed using the Student's *t*-test.

## Reporting

Reporting followed the CONSORT guidelines for reporting randomised controlled trials in parallel group designs (Mohr *et al.*, 2009; Mohr *et al.*, 2010; Schulz, Altman & Moher, 2010). Research protocol documents are available if requested. Twenty three of 25 checklist items were adhered to in this report. It was not possible to comply with item 23 because this trial was not pre-registered. Item 5 requires more contextual details of trial sites, which were previously reported by Waghorn, Childs, *et al.* (2012).

## Results

The CONSORT diagram (Schulz *et al.*, 2010) showing the trial design is at Figure 1. Baseline characteristics of the two groups are shown in Table 1. Over 90% of participants in both allocation conditions were diagnosed with either a Psychotic Disorder or with Bipolar Affective Disorder. After randomisation, participants in the IPS group did not differ from those in the control service on any of the nine demographic or 12 clinical variables examined. Early attrition was greater than expected in both allocation groups at 28.4% (see Table 2). In the intervention condition, 25 (23.6%) completed the baseline interview and took no further

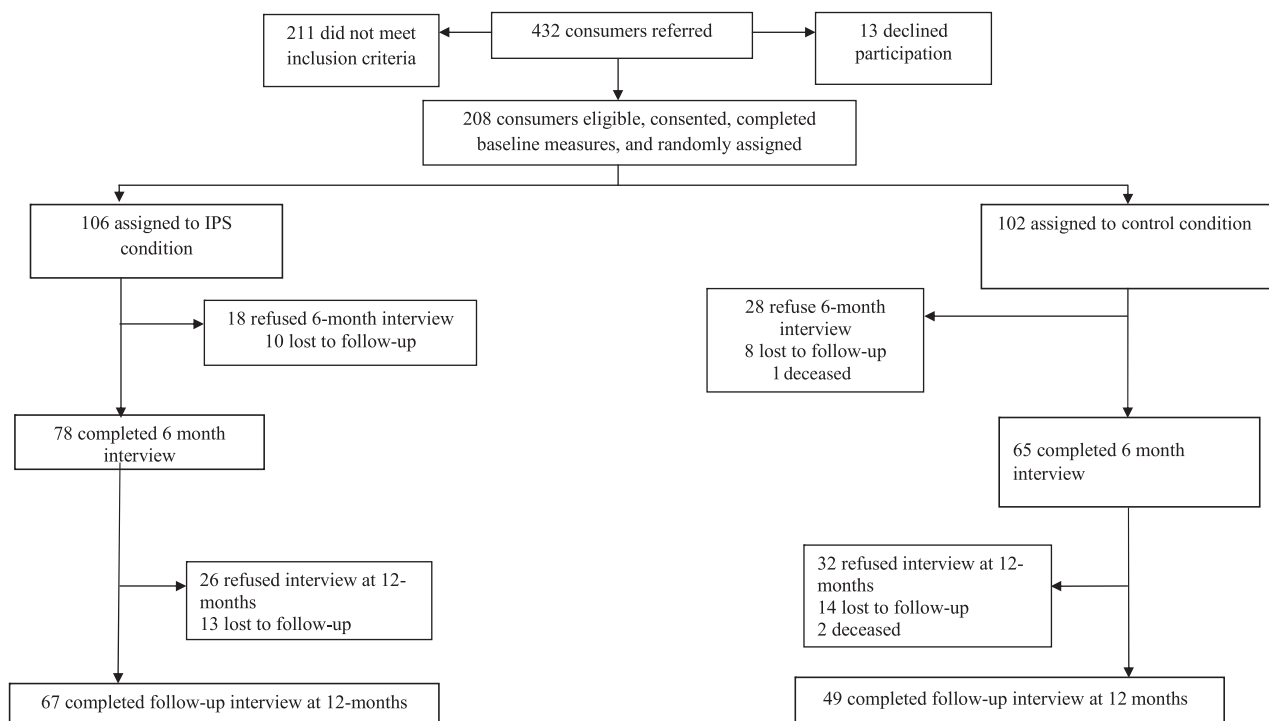


FIGURE 1: Participant CONSORT flow chart from baseline to 12 months.

**TABLE 1:** Participant characteristics at baseline by intervention allocation (n/N, %, unless stated otherwise)

Characteristics	IPS N = 106/208 (51%) n (%)	Control N = 102/208 (49%) n (%)	Difference†
Age			
Mean (SD)	32.0 (8.9)	32.8 (8.9)	$t = 0.662, df = 199, P = 0.509$
Sex			
Men	73 (50.7)	71 (49.3)	$\chi^2 = 0.013, P = 0.908$
Women	33 (51.6)	31 (48.4)	
Language spoken at home			
Other than English	11 (61.1)	7 (38.9)	$\chi^2 = 0.624, P = 0.430$
English	94 (51.4)	89 (48.6)	
Partner status			
Partnered (married, defacto)	10 (58.8)	7 (41.2)	$\chi^2 = 0.323, P = 0.570$
Not partnered (single, separated, divorced)	95 (51.6)	89 (48.4)	
Primary income source			
Disability support pension	74 (52.1)	68 (47.9)	$\chi^2 = 0.010, P = 0.920$
Newstart (unemployment benefit)	14 (50.0)	14 (50.0)	
Other (e.g., superannuation)	7 (53.9)	6 (46.1)	
Employment history			
Employed in year prior to participation	39 (58.2)	28 (41.8)	$\chi^2 = 2.077, P = 0.149$
For those employed in previous year, weeks employed, mean (SD)	17.4 (14.1)	17.7 (14.2)	$t = 0.084, df = 65, P = 0.9334$
Assistance job seeking			
Received assistance in the previous year	32 (58.2)	23 (41.8)	$\chi^2 = 1.072, P = 0.301$
Educational attainment			
Completed year 12	69 (48.9)	72 (51.1)	$\chi^2 = 1.733, P = 0.188$
Did not complete year 12	36 (59.0)	25 (41.0)	
Diagnostic category			
Psychotic disorder‡	90 (53.6)	78 (46.4)	$\chi^2 = 1.069, P = 0.301$
Bipolar affective disorder	7 (41.2)	10 (58.8)	$\chi^2 = 0.876, P = 0.349$
Major depression or anxiety disorder	6 (46.2)	7 (53.8)	$\chi^2 = 0.192, P = 0.661$
Positive symptoms (SAPS)			
Global rating of hallucinations, mean (SD)	1.0 (1.4)	1.2 (1.5)	$t = 0.828, df = 199, P = 0.409$
Global rating of delusions, mean (SD)	1.1 (1.5)	1.4 (1.5)	$t = 1.571, df = 199, P = 0.118$
Global rating of bizarre behaviour, mean (SD)	0.4 (0.8)	0.4 (0.9)	$t = 0.483, df = 199, P = 0.629$
Global rating of positive thought disorder, mean (SD)	0.3 (0.7)	0.4 (0.9)	$t = 0.479, df = 199, P = 0.633$
Negative symptoms (SANS)			
Global rating of affective flattening, mean (SD)	1.2 (1.3)	1.4 (1.4)	$t = 1.287, df = 199, P = 0.200$
Global rating of alogia, mean (SD)	0.6 (1.1)	0.8 (1.2)	$t = 1.373, df = 199, P = 0.171$
Global rating of avolition-apathy, mean (SD)	1.5 (1.4)	1.8 (1.3)	$t = 1.468, df = 199, P = 0.144$

TABLE 1: (Continued)

Characteristics	IPS N = 106/208 (51%) n (%)	Control N = 102/208 (49%) n (%)	Difference†
Global rating of anhedonia-asociality, mean (SD)	1.5 (1.5)	1.8 (1.5)	$t = 1.151, df = 199, P = 0.251$
Global rating of attention, mean (SD)	0.3 (0.7)	0.4 (0.8)	$t = 0.564, df = 199, P = 0.574$

SD, standard deviation; SAPS, scale for the assessment of positive symptoms; SANS, scale for the assessment of negative symptoms.

†T-tests and chi-square tests, two tailed. All cases were not statistically significant.

‡Psychotic disorders included Schizophrenia, Schizoaffective Disorder, First Episode Psychosis, Depressive Psychosis and Psychosis not otherwise specified.

part in the study. This was not significantly different to the control condition where 34 (33.3%) took no further part in the study. The 12-month interview was completed by more (67 of 106, 63.2%) in the intervention; than in the control (49 of 102, 48.0%; chi-square = 4.85,  $P = 0.028$ ). Attrition cases were more likely to speak a language other than English at home, but otherwise did not differ from those that remained in the study (see Table 2).

### Fidelity to evidence-based principles

Fidelity to evidence-based principles of supported employment results were in rank order: West Moreton-intervention (score range 70–73 of maximum 75, within the good fidelity range of 66–75); Cairns-intervention (68–71, good fidelity); Townsville-intervention (68–70, good fidelity); Princess Alexandra Hospital-intervention (66–68, good fidelity); Townsville-control (65, fair fidelity); Cairns-control (61, fair fidelity); West Moreton-control (estimate 56–65, fair fidelity); Princess Alexandra Hospital-control (estimate 56–65, fair fidelity). We could not always directly measure the fidelity of the control services involved, because we were not aware of all control services involved. In these cases, we estimated a likely fidelity range based on our knowledge of the type of service and its contractual requirements. Overall, the four interventions achieved good fidelity to IPS principles in the range 66–73, while all four controls were estimated at fair fidelity (range 56–65).

### Primary vocational outcomes

The primary outcomes by intervention type and site are shown in Tables 3 and 4. In terms of commencing competitive employment, at six months the intervention services when aggregated were significantly more effective than the control services (31.1% vs. 18.6%). This effect strengthened at 12 months (42.5% vs. 23.5%) as shown by the odds ratio favouring the intervention, increasing from 1.97 to 2.40. However, at site level, both the six

and 12-month results showed variability, with only one site (Cairns) recording a statistically significant positive effect for the intervention. Three of the four sites trended in this direction, and one in the opposite direction, but due to low power further inter-site comparisons were not justified.

The co-primary outcome of receiving a vocational benefit also favoured the intervention condition. At six months, the aggregated results showed greater odds of obtaining a vocational benefit for the intervention compared to the control (OR: 2.17, 95% CI: 1.18–3.98). This effect was maintained at 12 months, where 48.1% in the intervention obtained a vocational benefit vs. 30.4% in the control condition (see Table 4).

### Exclusion of participants who received a mixed (contaminated) intervention

In a separate analysis, we isolated the 28 persons who after the six month interview, transferred from the control to the intervention condition. By 12 months, 39.3% (11 of 28) of those that received this mixed intervention, obtained competitive employment and 42.9% (12 of 28) attained a vocational benefit. This result falls between that attained by the intervention and the control conditions, indicating that delayed access to the person's preferred intervention moderates employment outcomes.

Another way to manage this contamination is by exclusion from the 12-month analysis. When so excluded, both the overall effect in terms of competitive employment, and the effect at West Moreton strengthened. In West Moreton, the proportion commencing competitive employment increased to 47.6% (20 of 42) in the intervention condition vs. 21.7% (5 of 23) in the control service (OR: 3.27, 95% CI: 1.02–10.45). Overall, those receiving the IPS intervention over 12 months had nearly 3.5 times greater odds (CI = 1.70–7.05) of commencing competitive employment in comparison to controls (42.5% vs. 17.6%). The aggregated results in terms

**TABLE 2:** Early attrition characteristics: Dropouts compared to those that remained in the study

Characteristics	Baseline completed and no further participation <i>n</i> = 59/208 (28.4%) <i>n</i> (%)	Completed at least 1 further interview <i>n</i> = 149/208 (71.6%) <i>n</i> (%)	Difference†
Intervention allocation			
IPS	25 (23.6)	81 (76.4)	$\chi^2 = 2.431, P = 0.119$
Control	34 (33.3)	68 (66.7)	
Age			
Mean (SD)	31.9 (9.1)	32.7 (8.8)	$t = 0.593, df = 206, P = 0.554$
Sex			
Men	41 (28.5)	103 (71.5)	$\chi^2 = 0.003, P = 0.959$
Women	18 (28.1)	46 (71.9)	$\chi^2 = 0.003, P = 0.959$
Language spoken at home			
Other than English	10 (52.6)	9 (47.4)	$\chi^2 = 6.059, P = \mathbf{0.014}$
English	49 (25.9)	140 (74.1)	$\chi^2 = 6.059, P = \mathbf{0.014}$
Partner status			
Partnered (married, living defacto)	7 (41.2)	10 (58.8)	$\chi^2 = 1.495, P = 0.221$
Not partnered (single, separated, divorced)	52 (27.2)	139 (72.8)	$\chi^2 = 1.495, P = 0.221$
Primary income source			
Disability support pension	40 (27.2)	107 (72.8)	$\chi^2 = 0.286, P = 0.867$
Newstart (unemployment benefit)	9 (32.1)	19 (67.9)	$\chi^2 = 0.227, P = 0.634$
Other (e.g. superannuation)	4 (28.6)	10 (71.4)	
Employment history			
Employed in year prior to participation	23 (39.0)	50 (33.6)	$\chi^2 = 0.546, P = 0.460$
Weeks employed in past year, mean (SD)	16.7 (13.1)	17.3 (15.2)	$t = 0.182, df = 71, P = 0.856$
Assistance with job seeking			
Received assistance in the previous year	13 (23.6)	42 (76.4)	$\chi^2 = 0.823, P = 0.364$
Educational attainment			
Completed year 12	13 (21.0)	49 (79.0)	$\chi^2 = 2.378, P = 0.123$
Did not complete year 12	46 (31.5)	100 (68.5)	
Diagnostic category			
Psychotic disorder‡	51 (29.1)	124 (70.9)	$\chi^2 = 0.328, P = 0.567$
Bipolar affective disorder	4 (23.5)	13 (76.5)	
Major depression or anxiety disorder	2 (15.4)	11 (84.6)	
Positive symptoms (SAPS)			
Global rating of hallucinations, mean (SD)	0.9 (1.3)	1.1 (1.5)	$t = 0.939, df = 206, P = 0.348$
Global rating of delusions, mean (SD)	1.0 (1.5)	1.3 (1.5)	$t = 1.404, df = 206, P = 0.162$
Global rating of bizarre behaviour, mean (SD)	0.4 (0.9)	0.4 (0.8)	$t = 0.048, df = 206, P = 0.961$
Global rating of positive thought disorder, mean (SD)	0.4 (0.8)	0.3 (0.7)	$t = 0.603, df = 206, P = 0.547$
Negative symptoms (SANS)			
Global rating of affective flattening, mean (SD)	1.1 (1.3)	1.3 (1.4)	$t = 1.020, df = 206, P = 0.309$
Global rating of alogia, mean (SD)	0.5 (1.0)	0.7 (1.2)	$t = 1.109, df = 206, P = 0.269$



TABLE 2: (Continued)

Characteristics	Baseline completed and no further participation <i>n</i> = 59/208 (28.4%) <i>n</i> (%)	Completed at least 1 further interview <i>n</i> = 149/208 (71.6%) <i>n</i> (%)	Difference†
Global rating of avolition-apathy, mean (SD)	1.5 (1.3)	1.7 (1.4)	<i>t</i> = 0.714, <i>df</i> = 206, <i>P</i> = 0.476
Global rating of anhedonia-asociality, mean (SD)	1.5 (1.4)	1.7 (1.5)	<i>t</i> = 0.985, <i>df</i> = 206, <i>P</i> = 0.326
Global rating of attention, mean (SD)	0.3 (0.7)	0.3 (0.7)	<i>t</i> = 0.001, <i>df</i> = 206, <i>P</i> = 0.999

SD, standard deviation; FU, follow-up; SAPS, scale for the assessment of positive symptoms; SANS, scale for the assessment of negative symptoms.

†*T*-tests and chi-square tests, two tailed. All cases were not statistically significant.

‡Psychotic disorders included Schizophrenia, Schizoaffective Disorder, First Episode Psychosis, Depressive Psychosis and Psychosis not otherwise specified.

of obtaining a vocational benefit also increased at 12 months. Those in the intervention condition had 2.7 times greater odds (CI = 1.41-5.12) of obtaining a vocational benefit compared to controls (48.1% vs. 25.7%).

## Secondary vocational outcomes

Those in the intervention group did not accumulate greater employment duration over 12 months of assistance compared to the control service. Those receiving the intervention were employed for a mean duration of 25.3 weeks (SD: 16.5) in comparison to 21.7 weeks (SD: 17.5) in the control service. This difference was not statistically significant. Those employed via the intervention worked on average 20.4 hours per week (SD: 14.9) compared to 25.5 hours per week (SD: 16.3) among controls. Those in the intervention condition appeared to earn a higher hourly wage compared to those in the control condition (\$AUS18.5 per hour vs. \$AUS16.0 per hour). However, this apparent difference was not statistically significant.

Job diversity did not appear to differ by intervention type. Jobs were classified into industry-based job categories (Australian Bureau of Statistics, 1997) and the categories represented by each intervention were examined. In the intervention group seven jobs were in consumer companion, disability support and peer support roles at six months, while 26 other jobs covered 17 job type classifications. In the control condition, six jobs were in the retail trade, building cleaning and gardening services while another 13 jobs represented nine job categories.

## Discussion

These results show that IPS can be implemented in Australia using existing mental health services to host a

co-located full-time employment specialist, employed and co-supervised by a local disability employment service. The IPS supported employment intervention was significantly more effective compared to the control service which involved less formal and less integrated arrangements. The control service involved mental health staff referring consumers to nearby disability employment services, but did not require a formal relationship with those service providers. These results (42.5% vs. 23.5% commencing employment in 12 months) show a reduction in effect strength when IPS is implemented via this approach, compared to USA controlled trials (Bond, Drake *et al.*, 2012). This trial also failed to match the strength of combined results over 12 months (56.8% commencing employment) reported in a four-site implementation of IPS in regional Australia (Morris *et al.*, in press), which similarly utilised existing service systems. Our results also fell short of the employment commencement outcomes reported in a single site controlled trial of IPS for young Australians with first episode psychosis (Killackey *et al.*, 2008). On the positive side, these results represent a 19% improvement over referring consumers of mental health services to nearby disability employment services. These results also exceed those reported by Howard *et al.* in a multi-site controlled trial of IPS in the UK (Howard *et al.*, 2010; Latimer, 2010).

In principle, IPS can be successfully implemented in Australia in a sustainable way with community mental health services hosting this programme. The willingness of mental health services to provide evidence-based supported employment has increased since this trial was conducted (Harvey *et al.*, 2013; Waghorn, Childs, *et al.*, 2012). However, the key issue raised by this study is why this result was not closer to, or greater than, the mean 60% commencing employment reported in USA

**TABLE 3:** *Employment outcomes (ever employed<sup>†</sup>) following 6 and 12 months employment assistance*

Site (sample)	Condition‡	Sample§ n (%)	At 6 months			At 12 months		
			Ever employed n (%)	Not employed n (%)	OR (95% CI)	Ever employed n (%)	Not employed n (%)	OR (95% CI)
Princess Alexandra Hospital, Brisbane (n = 47)	Intervention	27 (57.4)	9 (33.3)	18 (66.7)	4.50	11 (40.7)	16 (59.3)	3.90 (0.92, 16.57)
	Control	20 (42.6)	2 (10.0)	18 (90.0)	(0.85, 23.80)	3 (15.0)	17 (85.0)	
Cairns Mental Health Service (n = 45)	Intervention	20 (44.4)	8 (40.0)	12 (60.0)	3.50	9 (45.0)	11 (55.0)	<b>4.30 (1.08, 17.17)*</b>
	Control	25 (55.6)	4 (16.0)	21 (84.0)	(0.87, 14.11)	4 (16.0)	21 (84.0)	
Townsville Mental Health Service (n = 35)	Intervention	17 (48.6)	2 (11.8)	15 (88.2)	0.35	5 (29.4)	12 (70.6)	0.83 (0.20, 3.49)
	Control	18 (51.4)	5 (27.8)	13 (72.2)	(0.06, 2.10)	6 (33.3)	12 (66.7)	
West Moreton Mental Health Service, Brisbane (n = 81)	Intervention	42 (51.9)	14 (33.3)	28 (66.7)	1.94	20 (47.6)	22 (52.4)	2.31 (0.92, 5.83)
	Control	39 (48.1)	8 (20.5)	31 (79.5)	(0.71, 5.31)	11 (28.2)	28 (71.8)	
All sites (n = 208)	Intervention	106 (51.0)	33 (31.1)	73 (68.9)	<b>1.97</b>	45 (42.5)	61 (57.5)	<b>2.40 (1.32, 4.36)**</b>
	Control	102 (49.0)	19 (18.6)	83 (81.4)	<b>(1.04, 3.77)*</b>	24 (23.5)	78 (76.5)	

OR, odds ratio; CI, confidence interval (95%).

†Ever employed was defined as any competitive employment of one day or more. Jobs where temporary wage subsidies were paid to employers were not excluded from this definition, as wage subsidies are now widely used throughout Australia.

‡Intervention group was IPS supported employment. The Control received employment assistance provided by nearby disability employment services.

§Sample size represents all those included in the study who were eligible and consented for the trial, and who completed baseline interviews.

\*Significance  $P < 0.05$  (shown in bold).

\*\*Significance  $P < 0.01$  (shown in bold).

controlled trials (Bond, Drake *et al.*, 2012). The high fidelity scores of the intervention sites reported in this trial are usually associated with better employment outcomes. Yet the actual results obtained suggest that either these fidelity scores were inflated, or that factors other than fidelity are moderating the effect on employment outcomes in the Australian context (Morris *et al.*, in press).

We speculate that there may be at least three moderating factors: (i) employment specialist expertise; (ii) the strength of leadership of the steering group and in the mental health team; and (iii) other non-IPS practices that hinder the adoption of IPS principles (Morris *et al.*, in press; Waghorn, Childs, *et al.*, 2012). One way to counter these moderators is through training and technical support for IPS practices which includes regular external fidelity assessments, and regular feedback from these assessments integrated into a comprehensive evaluation plan. It is likely that the absence of external technical support provided on-site, may account for the weaker performance observed in this trial. An ongoing evaluation strategy appears needed, not just to report

employment outcomes, but to assess referral rates, attrition and reasons for attrition, and potential conflicts between evidence-based practices and requirements of Australian Government funding contracts.

## Limitations

Although this is the largest randomised control trial of IPS reported in Australia to date, it has important limitations. The main limitation was the lack of sufficient resources to provide a technical support team to each site to regularly train staff and assess IPS fidelity. This is particularly important for regional and remote sites that may have less knowledge and awareness of IPS principles. Such support may have prevented the early failure of implementation at the Gold Coast.

Instead we used low cost forms of site support which involved initial on-site fidelity assessment, followed by regular telephone assessments for more distant locations. Resource limitations also restricted our ability to provide on-site training particularly to the more remote locations, particularly at unexpected times when staff

**TABLE 4:** Any vocational benefit† following 6 and 12 months employment assistance

Site	Condition‡	Sample§ n (%)	At 6 months			At 12 months		
			Any vocational benefit n (%)	No vocational benefit n (%)	OR (95% CI)	Any vocational benefit n (%)	No vocational benefit n (%)	OR (95% CI)
Princess Alexandra Hospital, Brisbane (n = 47)	Intervention	27 (57.4)	9 (33.3)	18 (66.7)	4.50	11 (40.7)	16 (59.3)	3.90 (0.92, 16.57)
	Control	20 (42.6)	2 (10.0)	18 (90.0)	(0.85, 23.80)	3 (15.0)	17 (85.0)	
Cairns Mental Health Service (n = 45)	Intervention	20 (44.4)	11 (55.0)	9 (45.0)	3.14	12 (60.0)	8 (40.0)	3.19 (0.93, 10.88)
	Control	25 (55.6)	7 (28.0)	18 (72.0)	(0.91, 10.86)	8 (32.0)	17 (68.0)	
Townsville Mental Health Service (n = 35)	Intervention	17 (48.6)	4 (23.5)	13 (76.5)	0.80	7 (41.2)	10 (58.8)	1.4 (0.35, 5.54)
	Control	18 (51.4)	5 (27.8)	13 (72.2)	(0.17, 3.67)	6 (33.3)	12 (66.7)	
West Moreton Mental Health Service, Brisbane (n = 81)	Intervention	42 (51.9)	17 (40.5)	25 (59.5)	2.27	21 (50.0)	21 (50.0)	1.80 (0.73, 4.35)
	Control	39 (48.1)	9 (23.1)	30 (76.9)	(0.86, 5.96)	14 (35.9)	25 (64.1)	
All sites (n = 208)	Intervention	106 (51.0)	41 (38.7)	65 (61.3)	<b>2.17</b>	51 (48.1)	55 (51.9)	<b>2.12 (1.20, 3.75)**</b>
	Control	102 (49.0)	23 (22.5)	79 (77.5)	<b>(1.18, 3.98)*</b>	31 (30.4)	71 (69.6)	

OR, odds ratio; CI, confidence interval (95%).

†Any vocational benefit is defined as commencing competitive employment or enrolling in formal education or vocational training leading to a recognised qualification.

‡The intervention condition was IPS supported employment. The Control condition received employment assistance provided by nearby disability employment services.

§Sample size represents all those included in the study who were eligible and consented for the trial, and who completed baseline interviews.

\*Significance  $P < 0.05$  (shown in bold).

\*\*Significance  $P < 0.01$  (shown in bold).

turnover occurred. With hindsight we now consider the use of a regional technical support team an essential component of future trials, perhaps modelled on the support provided in a recent New South Wales implementation of IPS (Morris *et al.*, in press).

We also used the earlier 15-item version of the fidelity scale which is not as useful for service development as the current 25-item version (Bond, Petersen *et al.*, 2012). All employment services that received referrals from this study, were contracted to the same Australian Government department (Department of Education, Employment and Workplace Relations, 2012), with common obligations and contract requirements. These requirements helped by setting minimum service intensity levels for control services, and provided standards for working with people with disabilities and health conditions. However, some contract conditions hindered the implementation of IPS practices by delaying service provision, but the contract did not preclude our implementations of the IPS approach. The major lesson learned is that future studies of this type need more

resources for training and external fidelity assessment, to optimise implementation in Australia's challenging service delivery context.

Early attrition was higher than expected. The majority of these continued in the vocational service but refused to take part in the data collection interviews, hence no further information on their vocational progress was obtained. This attrition was higher than reported in most previous studies of IPS (Bond *et al.*, 2008; Morris *et al.*, in press).

Although early attrition was not significantly different across conditions (see Table 2), completion rates of 12-month interviews were significantly higher in the intervention than in the control condition. Attrition is known to mediate the IPS effect through a negative relationship with the quality of the employment service (Burns *et al.*, 2007). This is because an effective client-centred service is more likely to engage and retain participants than a service not so individualised (Bond, 2004).

Nevertheless, uneven attrition at 12-months was a limitation to our ITT-based assumption that those who

did not complete this follow-up interview were to be retained in the analysis, while assuming no further vocational benefit. This is conservative for both conditions, but favours the condition with the least attrition. We assessed the potential bias in a separate analysis where those who did not complete 12-month interviews were excluded from the denominators for both conditions, for both primary outcomes. With respect to commencing competitive employment by 12 months, the aggregated difference lost significance, however, the proportions commencing employment increased in both conditions (intervention 52.2%, 35 of 67; control 34.7%, 17 of 49; OR: 2.06, CI: 0.96–4.40,  $P = 0.06$ ). With respect to obtaining a vocational benefit, both proportions again increased, while the difference narrowed and lost significance (intervention 61.2%, 41 of 67; vs. 46.9%, 23 of 49; OR: 1.78, CI: 0.85–3.76). Both results showed some contribution of attrition to the effect although the loss of power for detecting a difference seems to most account for the loss of statistical significance.

At a person level, early attrition was associated with one observed characteristic, namely speaking a language other than English at home (see Table 2). Feedback from those refusing interviews suggests that attrition for this reason could be reduced by shortening the interview duration and by compensating participants for their time. Unfortunately, limited resources precluded monetary compensation which we now consider essential for future trials of this type.

## Conclusions

Multi-site randomised controlled trials of psycho-social interventions in community psychiatry are both challenging and necessary to develop more effective evidence-based services. The results show that IPS is more effective than the non-integrated forms of supported employment known as Disability Employment Services in Australia. This result builds on previous international findings of the greater effectiveness of IPS compared to alternative vocational services, and shows that IPS can be successfully hosted by mental health services in Australia. However, the outcomes attained through utilising existing Australian service systems are likely to involve some loss of effect strength compared to previous USA trials. These results imply that existing mental health and disability employment service systems can be utilised and integrated for this purpose, but the effectiveness appears to depend on the amount of external training and support that can be provided. More support appears needed over what was provided in this trial, to establish and maintain integration, and to develop the new IPS knowledge and practices in both organisations. For future trials, a regional technical assistance team is recommended to provide more external support to all mental health teams attempting evidence-based supported employment in Australia.

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