Pathways of Care Longitudinal Study: Outcomes of Children and Young People in Out-of-Home Care

Weighting for the Pathways of Care Longitudinal Study: Update for Wave 4

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Technical Report No. 19

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Preface

The Pathways of Care Longitudinal Study (POCLS) is funded and managed by the New South Wales Department of Communities and Justice (DCJ). It is the first large-scale prospective longitudinal study of children and young people in out-of-home care (OOHC) in Australia. Information on safety, permanency and wellbeing is being collected from various sources. The child developmental domains of interest are physical health, socio-emotional wellbeing and cognitive/learning ability.

The overall aim of this study is to collect detailed information about the life course development of children who enter OOHC for the first time and the factors that influence their development. The POCLS objectives are to:

- Describe the characteristics, child protection history, development and wellbeing of children and young people at the time they enter OOHC for the first time.

- Describe the services, interventions and pathways for children and young people in OOHC, post restoration, post adoption and on leaving care at 18 years.

- Describe children's and young people's experiences while growing up in OOHC, post restoration, post adoption and on leaving care at 18 years.

- Understand the factors that influence the outcomes for children and young people who grow up in OOHC, are restored home, are adopted or leave care at 18 years.

- Inform policy and practice to strengthen the OOHC service system in NSW to improve the outcomes for children and young people in OOHC.

The POCLS is the first study to link data on children's child protection backgrounds, OOHC placements, health, education and offending held by multiple government agencies; and match it to first-hand accounts from children, caregivers, caseworkers and teachers. The POCLS database will allow researchers to track children's trajectories and experiences from birth.

The population cohort is a census of all children and young people who entered OOHC for the first time in NSW over the 18 month period between May 2010 and October 2011 (n=4,126). A subset of those children and young people who went on to receive final Children's Court care and protection orders by April 2013 (2,828) were eligible to participate in the study. For more information about the study please visit the study webpage www.facs.nsw.gov.au/resources/research/pathways-of-care.

The POCLS acknowledges and honours Aboriginal people as our First Peoples of NSW and is committed to working with the DCJ Aboriginal Outcomes team to ensure that Aboriginal children, young people, families and communities are supported and empowered to improve their life outcomes. The POCLS data asset will be used to

improve how services and supports are designed and delivered in partnership with Aboriginal people and communities.

DCJ recognises the importance of Indigenous Data Sovereignty (IDS) and Indigenous Data Governance (IDG) in the design, collection, analysis, dissemination and management of all data related to Aboriginal Australians. The POCLS is subject to ethics approval, including from the Aboriginal Health & Medical Research Council of NSW. DCJ is currently in the process of scoping the development of IDS and IDG principles that will apply to future Aboriginal data creation, development, stewardship, analysis, dissemination and infrastructure. The DCJ will continue to collaborate with Aboriginal Peoples and will apply the DCJ research governance principles once developed.

1 Introduction

Previous reports by Steel and Navin Cristina (2018, 2019) describe the development and implementation of weights designed to reduce potential biases due to non-response and attrition in the POCLS Waves 1-3. This report provides an update for the development of weights for wave 4 data and should be read in conjunction with the previous reports.

2 Summary of methods to produce weights

The approaches to determining the weights are as follows:

- Cross-sectional weights in Wave 1 for the in-OOHC component[1] and the Wave 2 restored component[2] are based on the response probability (RP) model estimated using logistic regression using auxiliary variables, giving $\hat{\phi}_1^A$ and $\hat{\phi}_2^B$.

- Cross-sectional weights in Wave 2, Wave 3 and Wave 4 for the in-OOHC component and Wave 3 and Wave 4 for the restored component use the pseudo attrition approach. This approach uses the attrition sample approach to include people who joined the sample after wave 1. This is done by creating pseudo samples of respondents who have respondents to the current wave and/or any of the previous waves. To make this clear we will use $\tilde{\phi}_2^A, \tilde{\phi}_3^A, \tilde{\phi}_4^A, \tilde{\phi}_3^B$ and $\tilde{\phi}_4^B$ to indicate the respective estimated RPs obtained using the pseudo attrition approach.

- Longitudinal weights use the sample responding to all of the relevant waves and are based on multiplying the relevant probabilities of appearing in the relevant sequence of waves. So for Wave 1-2; Wave1-3 and Wave 1-4 for in-OOHC and W 2-3 and Wave 3-4 for restored cases, the direct attrition approach is used, giving $\hat{\phi}_{12}^A, \hat{\phi}_{123}^A, \hat{\phi}_{1234}^A$ and $\hat{\phi}_{23}^B, \hat{\phi}_{234}^B$ respectively.

The RPs that are relevant are summarised in Table 1.

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[1] The in-OOHC component refers to the POCLS children who were in OOHC and were included in Wave 1.
[2] The restored component refers to the POCLS children who were restored to parents and were not included in Wave 1. These children were first included in Wave 2.

Table 2.1: Summary of estimated response probabilities

Wave (W)	in-OOHC	Restored
W1 Cross-sectional	$\hat{\phi}_1^A$	N/A
W2 Cross-sectional	$\tilde{\phi}_2^A = \tilde{\phi}_1^A \tilde{\phi}_{2.1}^A$	$\hat{\phi}_2^B$
W3 Cross-sectional	$\tilde{\phi}_3^A = \tilde{\phi}_1^A \tilde{\phi}_{2.1}^A \tilde{\phi}_{3.21}^A$	$\tilde{\phi}_3^B = \tilde{\phi}_2^B \tilde{\phi}_{3.2}^B$
W4 Cross-sectional	$\tilde{\phi}_4^A = \tilde{\phi}_1^A \tilde{\phi}_{2.1}^A \tilde{\phi}_{3.21}^A \tilde{\phi}_{4.321}^A$	$\tilde{\phi}_4^B = \tilde{\phi}_2^B \tilde{\phi}_{3.2}^B \tilde{\phi}_{4.32}^B$
W1-2 Longitudinal	$\hat{\phi}_{12}^A = \hat{\phi}_1^A \hat{\phi}_{2.1}^A$	N/A
W2-3 Longitudinal	N/A	$\hat{\phi}_{23}^B = \hat{\phi}_2^B \hat{\phi}_{3.2}^B$
W1-3 Longitudinal	$\hat{\phi}_{123}^A = \hat{\phi}_1^A \hat{\phi}_{2.1}^A \hat{\phi}_{3.2}^A$	N/A
W2-4 Longitudinal	N/A	$\hat{\phi}_{234}^B = \hat{\phi}_2^B \hat{\phi}_{3.2}^B \hat{\phi}_{4.3}^B$
W1-4 Longitudinal	$\hat{\phi}_{1234}^A = \hat{\phi}_1^A \hat{\phi}_{2.1}^A \hat{\phi}_{3.2}^A \hat{\phi}_{4.3}^A$	N/A

The corresponding weights are calculated as the inverse of the relevant estimated RP.

3 Analysis for producing weights for Wave 4

3.1 Weights for in-OOHC Component

3.1.1 Pseudo attrition weights Wave 4 in-OOHC

For the analysis of response at Wave 4 for those that responded at any of Wave 1, Wave 2, Wave 3 or Wave 4, the analysis was based on n=1,093 cases of which n=912 were respondents in Wave 4. The model was based on 7 degrees of freedom (d.f.), not counting the intercept term, and included the auxiliary variables age and gender, and the number of placement changes between Wave 3 and Wave 4 grouped into categories 0, 1, 2, 3, and 4+. Gender was not statistically significant but retained in the model.

For the distribution of the resulting weights:

$$\text{Median}=2.12, \text{Coefficient of Variation (CV)}=0.43,$$
$$\text{ratio of maximum to median (max/med)}=5.14,$$

which can be considered satisfactory.

3.1.2 Longitudinal weights Wave 1-4 in-OOHC

For the analysis of response at Wave 4 for those that responded at Wave 1 and Wave 2 and Wave 3 the analysis was based on n=882 cases of which n=734 were respondents in Wave 4. The model was based on 8 d.f. and included the auxiliary variables age and gender, number of placement changes between Wave 3 and Wave 4 and whether a report was made between Wave 3 and Wave 4. Gender was not statistically significant but retained in the model.

For the distribution of the resulting weights:

$$\text{Median}=2.51, \text{CV}=0.53, \text{max/med}=7.74.$$

While the CV of the weights is reasonable the ratio of the maximum to median weight is a bit high. The high weights correspond to cases that the RP modelling has successfully identified as having a low RP. This is showing that the modelling is working well but the variation in the weights can lead to some instability and high standard errors of estimates. Trimming the weights so that the maximum is 6 times the median results in the truncation of 1 case and the following distribution of the resulting weights:

$$\text{Median}=2.52, \text{CV}=0.51, \text{max/med}=6.00.$$

Truncating weights to be no more than 6 times the median effectively restricts the estimated RP from being less than 17% of the median RP.

3.2 Weights for restored component

3.2.2 Pseudo attrition weights Wave 4 restored

For the analysis of response at Wave 4 for those that responded at any of Wave 2 or Wave 3 or Wave 4 the analysis was based on n=78 cases of which n=50 were respondents in Wave 4. The model was based on 7 d.f. and included the auxiliary variables age group, gender, maltreatment issue (all categorical), and whether there was a report between Wave 3 and Wave 4. Gender was not statistically significant but retained in the model.

For the distribution of the resulting weights:

Median=10.00, CV=0.77, max/med=5.96,

which can be considered satisfactory.

3.2.3 Longitudinal weights Wave 2 and Wave 3 restored

For the analysis of response at Wave 4 for those that responded at Wave 2 and Wave 3 the analysis was based on n=57 cases of which n=31 were respondents in Wave 4. The model was based on 3 d.f. and included the variables age group and gender. Gender had a p-value of 0.07 and was retained in the model.

The occurrence of a report between Wave 3 and Wave 4, was statistically significant, but had only n=4 respondents out of n=18 of those with a report. The associated estimated odds ratio was relatively high at 9.08, reflecting that low response rate. It was judged that inclusion of this variable would affect the robustness of the RP model, and so it was not included.

For the distribution of the resulting weights:

Median=10.95, CV=1.52 max/med=13.57.

Both the CV and the ratio of the maximum to median weight are very high.

Trimming the weights so that the maximum is 6 times the median resulted in the truncation of 1 case and the following distribution of the resulting weights:

Median=13.05, CV=0.82, max/med=6.00.

While the CV is a little high, the resulting unequal weighting effect for standard errors is about 1.28.

It is important to note that, for the restored component the Wave 4 cross-sectional weights are based on only 50 respondents and the Wave 2-4 weights are based on only n=31 respondents. Any analysis based on Wave 4 data for the restored component should bear these small responding sample sizes in mind and be treated with caution.

Summary

These analyses have produced:

- Cross-sectional weights for the in-OOHC component for Wave 1, and the restored component for Wave 2 using the direct attrition approach

- Cross-sectional weights for in-OOHC for Wave 2, Wave 3, Wave 4 and restored for Wave 3 and Wave 4 using the pseudo attrition sample approach

- Longitudinal weights for in-OOHC for Wave 1-2, Wave 1-3, Wave 1-4 estimation and analysis using the direct attrition approach

- Longitudinal weights for restored for Wave 2-3 and Wave 2-4 estimation and analysis using the direct attrition approach.

The RPs modelling has produced weights with the following summary characteristics.

Table 3-1: Summary of distribution of weights

	In-OOHC			Restored		
Weights	Med	CV	Max/Med	Med	CV	Max/Med
W1 Cross-sectional	1.74	0.18	2.80	N/A	N/A	N/A
W2 Cross-sectional	1.95	0.27	4.07	4.89	0.44	3.05
W3 Cross-sectional	2.18	0.38	4.15	6.73	1.45	9.76
				7.21	*0.91*	*6.00*
W4 Cross-sectional	2.12	0.43	5.14	10.00	0.77	5.96
W1-2 Longitudinal	2.04	0.32	5.98	N/A	N/A	N/A
W2-3 Longitudinal	N/A	N/A	N/A	6.25	1.45	13.57
				7.47	*0.90*	*6.00*
W1-3 Longitudinal	2.28	0.47	8.31	N/A	N/A	N/A
	2.29	*0.45*	*6.00*			
W2-4 Longitudinal	N/A	N/A	N/A	10.95	1.52	13.57
				13.05	*0.82*	*6.00*
W1-4 Longitudinal	2.51	0.53	7.74	N/A	N/A	N/A
	2.52	*0.51*	*6.00*			

Note: figures in italics and bold are after weight trimming.

5 References

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