



# The Effect of Quarantining Welfare on School Attendance in Indigenous Communities

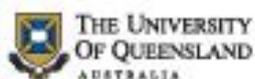
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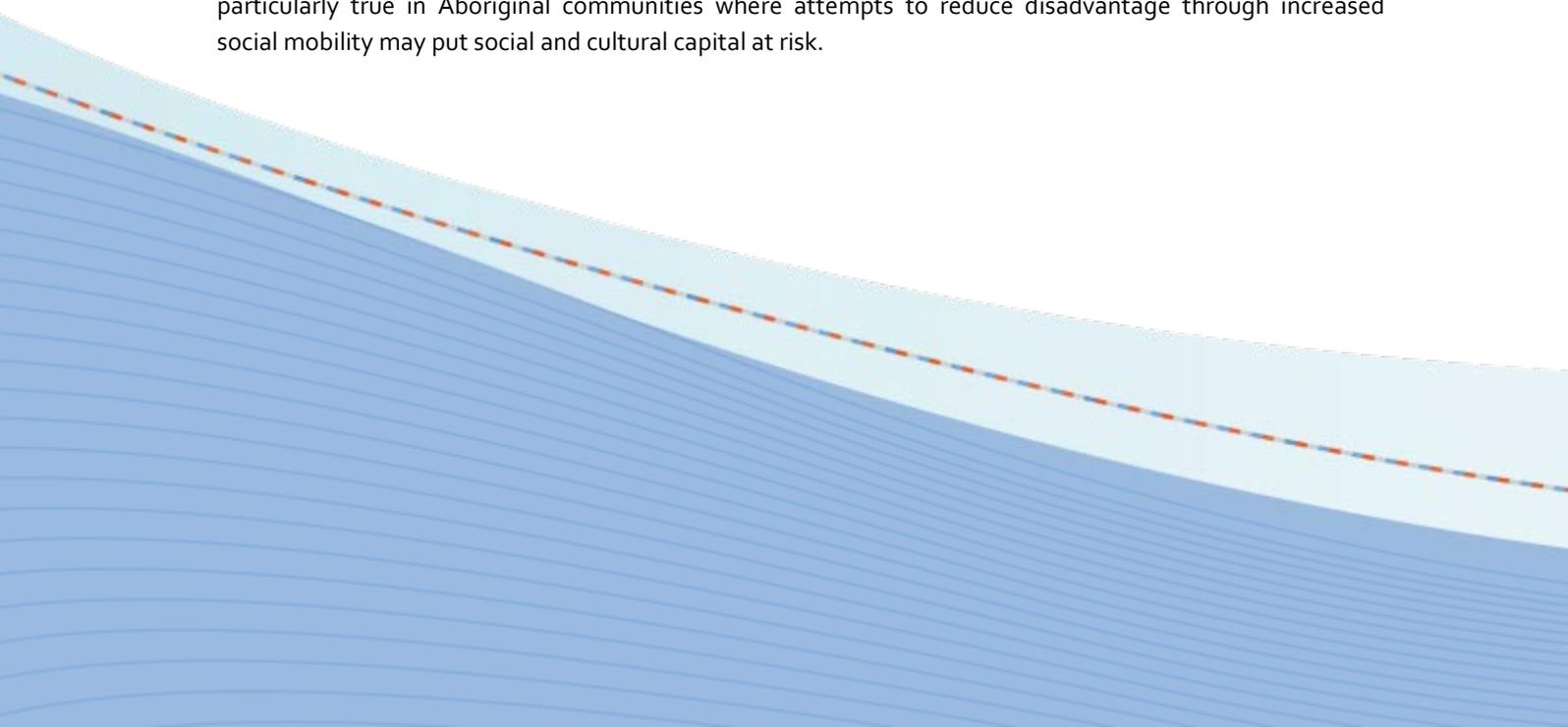
## NON-TECHNICAL SUMMARY

Indigenous people in Australia, Canada, New Zealand, and the United States often face extensive social and economic hardship despite living in some of the world's wealthiest nations. Unlike the case in international contexts, the Australian Government is unique in using the quarantining of welfare benefits as a key strategy in closing the gap in Indigenous outcomes. This approach – known as income management – sets aside 50 percent of welfare benefits to ensure that they are spent on priority items (food, housing, clothing, utilities, or transport) and not on excluded items (alcohol, cigarettes, gambling or pornography). The goal is to direct welfare payments towards essential needs; reduce the funds available for anti-social behaviors linked to child abuse and family dysfunction; protect women and the elderly from excessive demands for money; and improve the care of children.

Income management, however, has been controversial with critics arguing that it is paternalistic and proponents arguing that it benefits Aboriginal communities. To date, what is known about Australia's income management policy comes from qualitative evidence which can at best be described as mixed. Evidence based on sound policy evaluation methods is currently lacking. In this paper, we provide the first causal evidence linking income management to a key policy target – children's school attendance. By constraining people's spending choices, income management is meant to increase the chances that children's basic needs are being met, resulting in higher school engagement and greater educational attainment.

In contrast to the policy's objectives, we find no evidence that school attendance increased after the introduction of income management. In fact, we estimate that attendance fell by 2.7 percentage points on average in the short-run. Importantly, income management did not significantly affect student enrollments or mobility patterns into and out of Aboriginal communities; thus, the drop in school attendance does not appear to be due to increased churning in student enrollments or new students. Nor is it due to concurrent policy initiatives. Instead we find that the attendance penalty associated with the introduction of income management is dramatically reduced after the adoption of more flexible administrative arrangements, suggesting that implementation issues may be responsible for the temporary reduction in school attendance that we observe.

We argue that the way that income management was implemented may have resulted in income insecurity, barriers to day-to-day economic activity, and a loss of empowerment which may have led to increased family stress and had adverse consequences for parenting. Our results therefore suggest that policy makers should pay careful attention to the erosion of social capital when implementing new programs. This is particularly true in Aboriginal communities where attempts to reduce disadvantage through increased social mobility may put social and cultural capital at risk.



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## **Abstract**

This paper analyzes the impact of a recent initiative by the Australian Government to reduce disadvantage in Aboriginal communities by quarantining welfare benefits. The policy – known as income management – sets aside 50 percent of welfare benefits to ensure that they are spent on priority items (food, housing, clothing, utilities, or transport) and not on excluded items (alcohol, cigarettes, gambling or pornography). We identify the causal impact of income management on school attendance rates using a quasi-experimental approach that exploits a staggered policy roll-out across communities. Importantly, we consider the differential effect of income management on the attendance rates of boys vs. girls and primary vs. secondary school students. We also investigate four key mechanisms (concurrent policy initiatives, mobility patterns, student enrollment and implementation issues) through which income management may have influenced school attendance rates. We find no evidence that income management led to an increase in student attendance. Rather the introduction of income management reduced school attendance by 2.7 percentage points (4 percent) on average in the first five months after which attendance rates eventually returned to their initial levels. Importantly, income management did not significantly affect student enrollments or mobility patterns into and out of Aboriginal communities; thus, the drop in school attendance does not appear to be due to increased churning in student enrollments or new students. Nor are our results explained by confoundedness with other policy initiatives. Instead we find that the attendance penalty associated with the introduction of income management is dramatically reduced after the adoption of more flexible administrative arrangements suggesting that implementation issues may be responsible for the temporary reduction in school attendance that we observe.

**Keywords:** income management; in-kind transfers; policy evaluation; Aboriginals; disadvantage; welfare quarantining; Australia

# 1 Introduction

Indigenous people in Australia, Canada, New Zealand, and the United States often face extensive social and economic hardship despite living in some of the world's wealthiest nations. Indigenous communities have been shaped by many unique historical, cultural, and political events; nevertheless widespread disadvantage has been a nearly universal experience.<sup>1</sup> Rates of suicide and disease-related mortality are substantially higher in Indigenous populations than in general populations, for example, leading to a substantial gap in life expectancy (e.g. Hunter & Harvey, 2002; Bramley et al., 2004; Cooke et al., 2007; Clifford et al., 2013). Educational attainment and income levels are also lower (e.g. Cooke et al., 2007), while drug and alcohol problems (e.g. Brady, 2000); family violence (Memmott et al., 2001; Al-Yaman et al., 2006) and child abuse and neglect (Cross et al., 2000; Stanley et al., 2003; Sinha et al., 2011) are all more prevalent. In short, in “all four countries, Indigenous poverty has been not only deep and widespread but persistent, defying policy prescriptions” (Cornell, 2006, p. 2).

This paper analyzes the impact of a recent initiative by the Australian Government to reduce disadvantage in Aboriginal communities by quarantining welfare benefits. The policy – known as income management – sets aside 50 percent of welfare benefits to ensure that they are spent on priority items (food, housing, clothing, utilities, or transport) and not on excluded items (alcohol, cigarettes, gambling or pornography) (AIHW, 2010). The Australian Federal Government introduced income management in 2007 as part of a reform package – the Northern Territory Emergency Response (NTER) – in response to a highly publicized report documenting high levels of child sexual abuse and family violence within Aboriginal communities in the Northern Territory (NT) (Wild & Anderson, 2007). The goal is to direct welfare payments towards essential needs; reduce the funds available for anti-social behaviors linked to child abuse and family dysfunction; protect women and the elderly from excessive demands for money (“humbugging”); and improve the care of children (AIHW, 2010; Bray et al., 2012).

We identify the causal impact of income management on school attendance rates using a quasi-

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<sup>1</sup>Cornell (2006) discusses the differences in historical and contemporary models of self-government (self-management), land rights, and relations with central governments. Indigenous people occupy a unique policy space. They often have some form of self-governance, but like other citizens are also subject to the laws of the country in which they live (Brady, 2000).

experimental approach that exploits a staggered policy roll-out across communities.<sup>2</sup> Improving educational outcomes for Aboriginal children is a pressing policy imperative. Although Australian Social Security legislation allows welfare benefits to be up to 100 percent quarantined if families do not ensure that their children are enrolled and attending school, this has never been enforced in practice (Yu et al., 2008). By constraining people’s spending choices, income management is meant to increase the chances that children’s basic needs are being met resulting in higher school engagement and greater educational attainment (Bray et al., 2015).

Our focus on school participation is also motivated by the fact that – in addition to being an important driver of children’s life chances – attendance rates are both systematically recorded and likely to respond quickly to changes in socioeconomic conditions. Importantly, access to schools’ daily attendance data and exact program implementation dates allows us to precisely time the introduction of income management; in effect, communities that are treated later form the control group for communities that are treated earlier. In this way, we are able to overcome the many methodological hurdles associated with non-random program assignment, the absence of baseline data, small sample sizes, and the lack of comparators which often preclude impact evaluations of interventions targeting Aboriginals (Cobb-Clark, 2013).

Our research contributes to a growing literature that exploits variation in implementation timing to evaluate the impact of major social programs (Ludwig & Miller, 2007; Finkelstein & McKnight, 2008; Hoynes & Schanzenbach, 2009; Cascio et al., 2010; Hoynes et al., 2011; Bailey, 2012), empowerment zones (Busso et al., 2013) and community health centres (Bailey & Goodman-Bacon, 2015). We are the first to evaluate the effectiveness of income management as a strategy for reducing Indigenous disadvantage. Importantly, we consider the differential effect of income management on the attendance rates of boys vs. girls and primary vs. secondary school students. Aboriginal boys are at an educational disadvantage relative to Aboriginal girls from an early age (see Yap & Biddle, 2010; Wilson, 2013; Biddle & Meehl, 2016), while providing educational opportunities for high school students in remote Aboriginal communities is particularly challenging (Herbert et al., 2014). In light of this, it is important to understand whether income management has heterogeneous effects on students’ school attendance.

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<sup>2</sup>Importantly, income management was rolled out separately to other NTER measures (see Section 7.1).

We also investigate four key mechanisms – concurrent policy initiatives, mobility patterns, student enrollments and implementation issues – through which income management may have influenced school attendance rates. Many programs and infrastructure projects were launched as part of the NTER; thus, it is important to consider the extent to which the relationship between income management and attendance is confounded by concurrent policy effects. Moreover, Aboriginal families frequently leave their ‘home’ communities to travel to other remote communities for social and cultural reasons (Memmott et al., 2006), creating substantial attendance (and enrollment) churn as students enter and exit schools (Taylor & Dunn, 2010). Income management may have affected school attendance by changing families’ incentives or ability to temporarily leave their communities. At the same time, many children in the remote communities under study are not enrolled in school at all (Wilson, 2013), raising the potential for changing enrollment patterns to drive the relationship between income management and school attendance.

Finally, we also carefully consider whether the way that income management was implemented may have affected school attendance. The way that social and economic programs are implemented is often a defining factor in whether those programs achieve their intended goals (see Durlak & DuPre, 2008; Cerna, 2013). The lacklustre performance of the Learnfare initiative that linked families’ welfare payments to the school attendance of their teenage children, for example, is due in part to the failure to fully overcome the challenges associated with administering it (Ethridge & Percy, 1993). The form that financial incentives (or sanctions) take (Dee, 2011), the coherence of the underlying statutes (Meier & McFarlane, 1995), and the way that parents are engaged (Gennetian, Darling, & Aber, 2016) can all matter for program outcomes. Qualitative evidence indicates that the introduction of income management was characterized by a lack of consultation with Aboriginal communities, confusion about how to access existing benefits, and in some cases, short-run food insecurity (Yu et al., 2008); each may have affected children’s school attendance.

Our empirical strategy relies on the estimation of difference-in-difference models with controls for school (community) and time (daily) fixed effects. The resulting estimates have a causal interpretation so long as the roll-out of income management is unrelated to trends in schools’ attendance levels. We investigate the plausibility of this identification assumption by: i) carefully reviewing the administrative process used in the roll-out; ii) examining the relationship between community char-

acteristics and program roll-out; and iii) using event study methods to assess trends in attendance patterns pre- and post-income management. In all cases, the resulting evidence gives us confidence that our identification strategy is sound. Nonetheless, we reduce the potential for any remaining unobserved heterogeneity to confound our estimates by controlling for school-, day-of-the-week-, and grade-level fixed effects and allowing each school to have its own season-specific time-trend.

Our research makes an important contribution to the international debate on ending Indigenous disadvantage. Unlike the case in Canada, New Zealand, or the United States, the Australian Government is unique in using the quarantining of welfare benefits as a key strategy in closing the gap in Indigenous outcomes. Income management, however, has been controversial with critics arguing that it is paternalistic and proponents arguing that it benefits Aboriginal communities. To date, what is known about the NTER's income management policy comes from qualitative evidence which can at best be described as mixed. Despite widespread dissatisfaction with implementation problems and the proscriptive nature of the scheme (Yu et al., 2008), some Aboriginal Australians believe that income management has had benefits in improving people's diets, reducing humbugging, and increasing savings (Central Land Council, 2008; AIHW, 2010). Evidence based on sound policy evaluation methods is lacking. Despite this, the Australian Government remains committed to income management as a policy option.<sup>3</sup>

Policy makers often justify the restriction of welfare benefits by appealing to social preferences or paternalism, especially when the consumption of certain goods has either negative (e.g. alcohol and tobacco) or positive (e.g. education and health care) externalities for families and children (Currie & Gahvari, 2008). In some cases, welfare benefits are restricted through the provision of in-kind rather than cash benefits; in other cases, the receipt of cash benefits is conditional on the purchase of certain beneficial goods (e.g. nutritious food or health care), meeting work requirements, or ensuring that children attend school. Our evaluation of income management provides new evidence on the causal impact of restricting the way that welfare benefits can be spent on people's social and economic outcomes. Like conditional cash transfers, the goal of income management is to improve social and economic well-being in Aboriginal communities by increasing the consumption

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<sup>3</sup> The Australian Government announced in the May 2017 federal budget that income management will be extended in all existing sites until mid 2019. See [www.dss.gov.au](http://www.dss.gov.au).

of beneficial goods and services. Unlike programs in other countries which typically target only discretionary income or additional payments, Australia's scheme is compulsory and limits people's ability to spend core welfare entitlements (see Mendes et al., 2014). Our analysis also contributes to the literature on place-based policy interventions aimed at boosting local development. Income management is intended to be a community-level intervention, with benefits permeating throughout the community at large through positive spill-over effects. Such interventions have been widely implemented in disadvantaged regions of developed countries (Neumark & Simpson, 2015).

We find no evidence that income management led to an increase in student attendance. Rather the introduction of income management reduced school attendance by 2.7 percentage points (4 per cent) on average in the first five months after which attendance rates eventually returned to their initial levels. These results are robust to a variety of modelling specifications and sensitivity checks. Importantly, income management did not significantly affect student enrollments or mobility patterns into and out of Aboriginal communities; thus, the drop in school attendance does not appear to be due to increased churning in student enrollments or new students. Nor is it due to concurrent policy initiatives. Instead we find that the attendance penalty associated with the introduction of income management is dramatically reduced after the adoption of more flexible administrative arrangements suggesting that implementation issues may be responsible for the temporary reduction in school attendance that we observe.

## **2 Income Management in the Northern Territory**

The Northern Territory is vast, covering approximately one sixth of the Australian continent. More than half of its approximately 246,000 residents live in the capital city of Darwin. Aboriginal and Torres Strait Islanders make up 25.5 percent of the Northern Territory's total population – 51.0 percent of the population in remote areas – despite constituting only 2.8 percent of the Australian population overall.<sup>4</sup> The Northern Territory is governed by its own local government in conjunction with the Australian Federal Government and approximately half of the Northern

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<sup>4</sup> We will refer to people of Aboriginal or Torres Strait Islander descent as simply Aboriginal since the vast majority of Indigenous individuals in the Northern Territory identify as Aboriginal singularly or as both Torres Strait Islander and Aboriginal.

Territory is Aboriginal-owned as a result of the Aboriginal Land Rights (Northern Territory) Act of 1976.

Aboriginal kinship relationships are complex, dynamic and not easily captured by non-Aboriginal notions of family based on physical living arrangements (see Lohar et al., 2014; Martin, 2017; Walter, 2017, for reviews). In particular, people see themselves in relation to others in their local communities as well as in other remote areas, making it common for children and adults to move between households. Raising children is a collective responsibility; Aboriginal children are given a great deal of autonomy to develop their skills by exploring their environment under the watchful eyes of the community at large (Lohar et al., 2014; Muir & Bohr, 2014). Although parents have high educational aspirations for their children (Walter, 2017), education experts and community leaders have struggled to find ways to ensure that Aboriginal children can access “Western cultural capital” while at the same time nurturing their Aboriginality and Aboriginal culture (McTaggart, 1991; Trudgett et al., 2017). Low levels of school engagement and achievement have left critics arguing that education for Aboriginal students in remote parts of the Northern Territory has been “characterized by policy failure” (Fogarty et al., 2015, p. 1).

## **2.1 Background**

In 2006, the NT Government responded to several media reports of child sexual abuse in Aboriginal communities by establishing an independent review board to examine the issue and identify possible policy responses. The board’s report was finalized in April 2007 (Wild & Anderson, 2007). While the NT Government was still considering its own response, the Australian Federal Government intervened with the Minister for Indigenous Affairs declaring that there was “clear evidence that the Northern Territory Government was not able to protect these [Aboriginal] children adequately” (Brough, 2007) (p. 10). The result was the announcement on June 21, 2007 of a significant set of reforms collectively known as the Northern Territory Emergency Response. The NTER package was legislated on July 17, 2007, less than one month after it was announced.

Income management is the key welfare reform in the NTER. Once income management begins in a community, 50 percent of residents’ welfare entitlements is paid in the usual way. The remaining

50 percent is retained by Centrelink<sup>5</sup> in an individual account to be allocated to a combination of priority goods. Initially, people accessed their income-managed funds in three ways. First, in remote areas, purchases could be made at a licensed community store which would deduct funds from people's income-management accounts at the point of sale. Second, people could obtain store cards (gift cards) from Centrelink which were redeemable at participating stores in larger towns. Third, people could organize a third-party deduction, e.g. to a utility company or a landlord. Unallocated funds were retained in people's income-management accounts.

Early reviews of income management documented numerous implementation problems including a lack of understanding about the policy, difficulty in accessing funds (especially when outside the home community or outside of Centrelink's operating hours) and difficulty checking account balances (Central Land Council, 2008; FAHCSIA, 2008; Yu et al., 2008; AIHW, 2010). In response, Centrelink contact hours were extended to meet client demand during the transition period (FAHCSIA, 2008). Additionally, in late 2008, the Basics Card was introduced as a fourth, more flexible transaction method. The Basics Card operated through Australia's EFTPOS system.<sup>6</sup> It was particularly useful for people travelling outside of their home communities. Effectively displacing store cards, the Basics Card was perceived by users as a significant improvement to the previous system of accessing income-managed funds (AIHW, 2010).

## **2.2 The Roll-Out of Income Management**

Income management first commenced in September 2007 and was gradually rolled out over the next 13 months across 73 Aboriginal communities and associated town camps.<sup>7</sup> The roll-out occurred in clusters of typically three to four communities simultaneously in the northern and southern parts of the Northern Territory. Figure 1 highlights the progressive coverage of income management across communities.

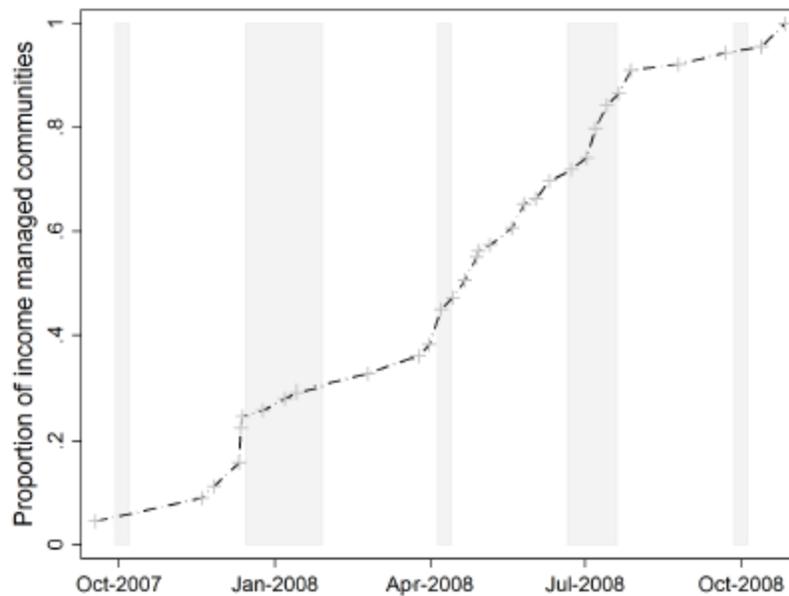
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<sup>5</sup>Centrelink is the Australian Government agency responsible for administering all transfer payments.

<sup>6</sup>EFTPOS (electronic funds transfer at the point of sale) is Australia's most widely used payment system handling 70 percent of debit card transactions. See [www.mobiletransaction.org/australian-eftpos-system/](http://www.mobiletransaction.org/australian-eftpos-system/).

<sup>7</sup>Town camps are small Aboriginal settlements located within the boundaries of major towns such as Darwin, Tennant Creek and Alice Springs.

Figure 1: Cumulative Coverage of Income Management Across NTER Communities



Notes: The graph shows the cumulative number of communities that have started income management on each date as a proportion of the total number of communities selected for income management. Shaded regions are school holiday periods. Crosses represent dates that income management commenced in one or more community. For the complete roll-out schedule see AIHW (2010).

The roll-out of income management was not strictly random; several conditions needed to be met before income management began, none of which related specifically to schools or children. The main criterion was that the community had at least one store meeting certain restrictions around sound financial practices (e.g. not engaging in monopoly pricing) and merchandise availability that could be licensed to participate in the scheme. The objective was to ensure that communities had access to affordable, high quality food (Brough, 2007).<sup>8</sup> Other requirements included that Centrelink staff were available to discuss income management and set up budget allocations; a government business manager was in place for the community; arrangements were in place for deductions associated with utilities and rent; and there was a police presence in the community. Once rolled out to a community, income management became compulsory. Exemptions were possible only in special circumstances when it could be demonstrated the person was not a regular member of an income-

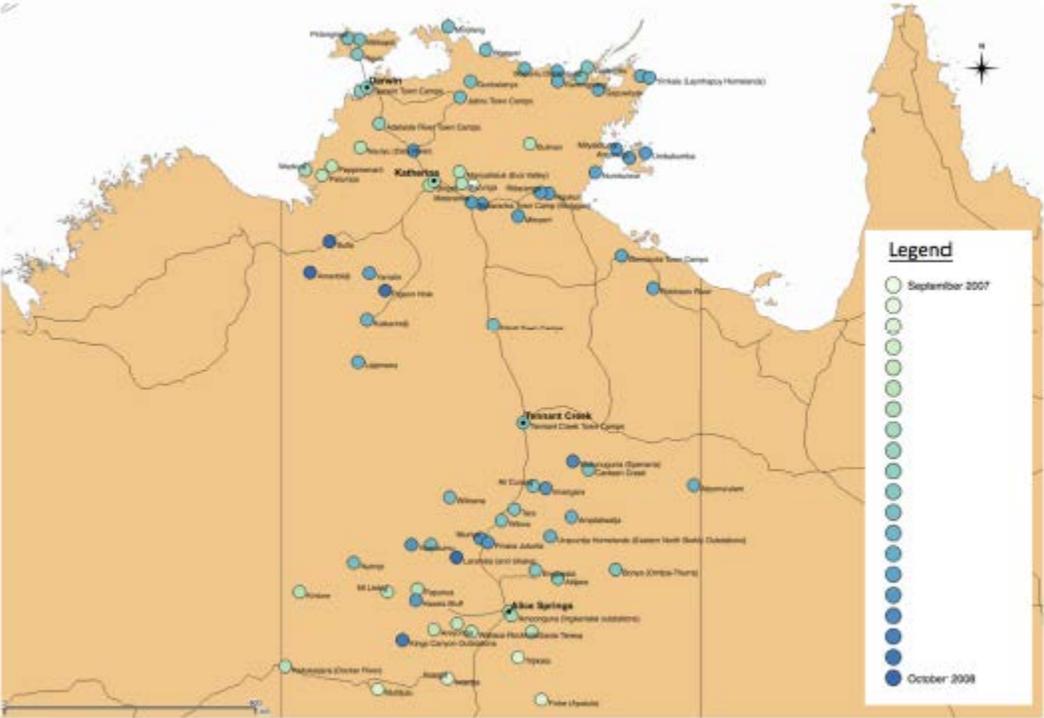
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<sup>8</sup>It is unclear whether store licensing affected food availability and pricing. The NTER legislation was vague regarding licensing requirements and one year after the NTER commenced many stores were still operating with high prices and low quality stock (Yu et al., 2008). A subsequent review found that many stakeholders believed store licensing had improved the quality and quantity of stock (CIRCA, 2011), although there is no pre- and post-data to support these perceptions.

managed community. By March 31, 2009, 15,125 people were subject to income management; only 649 exemptions (three percent of cases) had been granted (AIHW, 2010).

Our empirical strategy is valid so long as the roll-out of income management is orthogonal to trends in school attendance. We first consider the spatial variation in the timing of income management (see Figure 2). Although some regional clusters adopted income management at a similar time, there is no obvious spatial pattern to the roll-out itself.

Figure 2: Map of Communities Selected for Income Management and Program Commencement Dates



Notes: Color-coding on communities selected for income management reflects the date income management started in the relevant community as indicated in the legend. Major settlements in the Northern Territory are in boldface. People living in the municipal parts of these communities were not subject to income management (only those living in the associated town camps). Highways and arterial roads are identified by lines connecting certain communities.

Second, we formally test whether or not there is observed heterogeneity in the timing of income management by regressing the date that income management began on a set of community-level characteristics constructed from the 2006 Australian Census.<sup>9</sup> Unfortunately, the small size of some NT communities leaves us able to construct a full set of measures for only 55 of the 78 communities for which we observe school attendance. In nine other communities, we have data only on population

<sup>9</sup>See for example Hoynes and Schanzenbach (2009), Hoynes et al. (2011), Bailey (2012) and Bailey and Goodman-Bacon (2015) who adopt the same approach when relying on program timing for identification.

size and gender balance and in the remaining communities we have no data at all.<sup>10</sup> Estimation results based on the sub-sample of communities with complete data (n = 55) are presented in Column 1 of Table 1. Results based on the full sample (n = 64) which also control for an indicator of missing data are presented in Column 2.

Table 1: OLS Regression of Community Characteristics on Income Management Commencement Date

Variable	Model 1	Model 2
Population/100	0.803 (14.484)	2.508 (14.450)
(Population/100) <sup>2</sup>	-0.287 (0.681)	-0.349 (0.676)
Percentage male	2.996 (5.541)	0.372 (5.194)
Median age	7.159 (8.126)	8.040 (8.028)
Percentage English only language spoken at home	0.811 (0.615)	0.861 (0.587)
Labor force participation rate	-0.150 (1.005)	-0.045 (1.027)
Employment rate	0.228 (0.703)	0.230 (0.701)
Median personal income	0.168 (0.248)	0.166 (0.230)
Average people per household	25.728* (13.636)	25.512* (13.813)
Demographics miss		366.269 (260.483)
N	55	64
R <sup>2</sup>	0.090	0.077

Notes: Robust standard errors in parentheses. The dependent variable is the date income management was implemented in the community, with each day equal to one unit. Data on community characteristics are from the 2006 Australian Census using the geospatial unit 'Indigenous Local Area'. For the 14 communities for which we have no data, a suitably granular spatial unit could not be identified in the Census. Estimates are obtained by OLS. \* is statistical significance at the 10% level.

<sup>10</sup>There is no indication that our missing data are related to implementation date. The correlation coefficient between implementation date and an indicator for missing data is only 0.014 (p=0.902).

With the exception of household size (significant at 10 percent), we find no statistically significant effects. Our  $R^2$  is 0.090 in the limited sample and 0.077 in the full sample respectively; more than 90 percent of the variation in the timing of income management is unexplained by observed community-level characteristics. In comparison, Hoynes and Schanzenbach (2009) find that similar demographic characteristics explain 14 percent of the variation in the timing of Supplemental Nutrition Assistance Program (SNAP) benefits. Like Hoynes and Schanzenbach (2009), we interpret this as evidence that the timing of income management was not systematically related to community characteristics. Nevertheless, the institutional arrangements underlying the introduction of income management leads us to be cautious. We will account for any remaining selectivity associated with the non-random roll-out of income management by controlling for school (i.e. community-level) fixed effects in all estimations.

### **2.3 Community Reaction**

There was a mixed reaction to the introduction of the NTER generally, and income management in particular. Many experts criticised the haste and lack of consultation preceding the NTER arguing that, as a consequence, it was poorly designed (Anderson, 2016; Behrendt, 2016; Bennet & Green, 2016). There was also dissatisfaction in many Aboriginal communities with the way that income management was implemented and operated. In particular, Yu et al. (2008) cite a lack of consultation, misunderstanding about the way income management was meant to operate, uncertainty generated by rapid program changes, frustration with a loss in empowerment, and embarrassment associated with accessing income-managed funds when in urban areas. Despite this, the authors also find evidence of support for income management with some people reporting an improvement in the quality and quantity of available food, less humbugging, reduced tobacco purchases, and higher savings. One small survey of 141 people in six remote communities found that 51 percent of people were in favor of income management and 46 percent were opposed (Central Land Council, 2008), while a survey of 76 Centrelink clients found that two-thirds supported the policy (AIHW, 2010)

### 3 Previous Literature

Income management falls within a category of policies best described as ‘restricted welfare’. These policies include in-kind transfers, conditional cash transfers (CCTs) and income quarantining. In what follows, we provide a brief review of the restricted welfare literature, focusing on policies targeting disadvantaged populations in developed countries.

In-kind transfers, in the broadest sense, simply refer to the public provision of goods and services. Examples include public housing, medical care, child care and education. The most widely studied program with direct relevance to income management is arguably SNAP, which provides food vouchers to low-income families. Two important differences between SNAP and income management are worth noting however. First, SNAP is more restrictive than income management since benefits are limited to food purchases. Second, SNAP targets discretionary expenditure, while income management affects the welfare client’s core entitlement (Mendes et al., 2014). SNAP has been difficult to evaluate, primarily due to self-selection and misreporting of program participation, with estimates of its effectiveness varying considerably (see Currie, 2003; Hoynes & Schanzenbach, 2016, for reviews). The most compelling evidence exploits experimental or quasi-experimental variation. In particular, demonstration projects conducted in the 1980s indicate that providing benefits in the form of cash rather than coupons results in lower food expenditures; though the magnitude of the decline appears to be quite heterogeneous (see Fraker, Martini, & Ohls, 1995; Fraker, Martini, Ohls, & Ponza, 1995). Research exploiting variation in program commencement across counties also suggests that SNAP is associated with increased food expenditure (Hoynes & Schanzenbach, 2009) as well as improved birth weight (Almond et al., 2011) and gains in children’s health and women’s economic self-sufficiency (Hoynes et al., 2016).

Income management also shares similar objectives to a number of CCT programs operating in developed countries.<sup>11</sup> A common element of these programs is a focus on improving the health and education of dependent children in disadvantaged families. In several U.S. states, for example, receipt of Temporary Assistance for Needy Families (TANF) payments is conditional

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<sup>11</sup> Examples include the Opportunity New York City Family Rewards initiative and Canada’s Self Sufficiency project (see Mendes et al., 2014).

on parents meeting objectives relating to health-checks, immunizations, school attendance and student grades (Ziliak, 2015). While CCT programs have often been successful in developing countries (see Rawlings & Rubio, 2005), there is less evidence they are successful in developed countries. Opportunity NYC – a CCT program modelled on Mexico’s Oportunidades program – failed to improve educational outcomes or health in New York (Riccio et al., 2013), for example. Slavin (2010) reviews a large number of (predominately U.S.) CCT programs and finds that most do not improve school attendance or educational attainment. Similarly, Medgyesy and Temesváry (2013) find mixed evidence that CCT programs improve education and health outcomes.

Income quarantining has been the least utilized form of restricted welfare. Although this has become increasingly important in Australia, we are aware of only one other scheme internationally that involves involuntary income quarantining. Since 2012, New Zealanders aged 16-19 have been subject to an income management scheme similar to that studied here. While the New Zealand scheme does not directly target the Indigenous population, it does disproportionately affect it (Humpage, 2016). We are not aware of any impact evaluation of income management in New Zealand.

Overall, the literature on restricted welfare in developed countries suggests that, while some policies do seem to improve social and economic well-being (e.g. SNAP), many others fail to achieve their objectives and the long-term impact and cost-effectiveness of many programs remain unclear (SPRC, 2010). It is likely that the context and program fidelity are important predictors of program outcomes. Campbell and Wright (2005), for example, argue that programs which link welfare benefits to children’s school attendance need to be accompanied by case management, financial support, and other support services to work well.

To the best of our knowledge, only two studies use quantitative data to evaluate aspects of the NTER’s income management scheme. Brimblecombe et al. (2010) use time series data from a sample of 10 community stores to study purchasing patterns. Using a before-after time series model, the authors find no evidence that income management influenced spending patterns in the communities. The authors also caution against generalizing these findings since their sample only includes stores managed by the Arnhem Land Progress Aboriginal Corporation, and these stores already operated a voluntary ‘food card’ system before income management was introduced.

Lamb and Young (2011) have similar data on revenue from electronic gambling machines in two major townships – Alice Springs and Katherine. Although these towns were not covered by income management, they both have large Aboriginal settlements on their outskirts (town camps) that were affected. Most of the venues in their sample experienced no change in gambling, although two venues servicing predominately Aboriginal patrons were exceptions.

Our paper also contributes to the literature evaluating place-based policies. Unlike typical welfare programs which target recipients based on individual characteristics, place-based policies target people based on where they live in the belief that “in order to help people, one must build or revitalize communities” (Ladd, 1994, p. 195). Well known examples include State Enterprise Zones and Federal Empowerment Zones in the United States (see Neumark & Kolko, 2010; Ham et al., 2011; Busso et al., 2013; Freedman, 2013; Reynolds & Rohlin, 2015, for recent evaluations). Neumark and Simpson (2015) review this literature and find mixed evidence that place-based policies meet their objectives. Income management differs from most place-based policies in terms of its central mechanism; most schemes rely on initiatives like business subsidies and tax-breaks to improve local employment opportunities whereas income management relies on changes in the delivery of welfare. Income management also operates in a unique setting – remote Indigenous communities – while most place-based policies target poor urban areas. Our work provides an interesting extension of this literature.

## **4 Data**

### **4.1 Attendance Data**

Our analysis is conducted with data from the Northern Territory Early Childhood Data Linkage Project, which is funded through a Partnership Project between the National Health and Medical Research Council (NHMRC) and the NT Government. In particular, we rely on daily attendance and enrollment records provided by the NT Department of Education, covering all students enrolled in the public school system born from 1994 onwards.<sup>12</sup> Our attendance data also

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<sup>12</sup>We do not have data for private schools which operate in six of the communities in our sample.

provide daily indicators of whether a child is expected to attend a specific school on that day providing us with a measure of enrollment. The use of daily data is critical to our estimation strategy as it allows us to fully exploit variation in program timing, despite the policy being rolled-out over a relatively short time frame. Moreover, our data come from the NT Education Department's administrative system allowing us to avoid the usual challenges, e.g small sample size, sample selection, attrition bias and recall bias, associated with survey data.

The sample is restricted to the period 2006-2009 (inclusive). Since income management was first introduced in September 2007 and fully rolled-out by October 2008, this window covers approximately 1.5 years before and after the implementation period. We restrict our analysis to this window because the NTER income management scheme was reformed in 2010 in such a way that is not amenable to evaluation with our data.<sup>13</sup> Our observation window allows us to determine whether income management was effective in the short- to medium-term. To construct an estimation sample, we used the income management roll-out schedule published in AIHW (2010). This gives us the precise date on which income management commenced in each community. We matched communities to school names by looking up school addresses in the NT Schools Directory, or in some cases using the school's own website. We were able to match 130 schools in our data belonging to 78 separate communities. In most communities there is one major school; 61 communities have a single school only. Forty-seven of our schools are so called 'homeland learning centres'. These are government-funded education facilities operating in very remote areas without the staffing or infrastructure requirements of a regular school. They typically have only a few enrollments at any time and comprise only 3.2 percent of student-day observations in our sample.

We also observe students' year level in our data. In the Northern Territory, schooling is compulsory from ages 6-17 (implying that most students are legally obligated to be in school until at least the end of 10th grade). Grade levels are segmented into primary (1-6), middle (7-9) and senior

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<sup>13</sup>The rebranded scheme – New Income Management – commenced on July 1, 2010, was rolled out across the entire Northern Territory, and involved substantial changes to the original scheme (Bray et al., 2014). We are unable to evaluate its impact due to the very short roll-out period and the fact that post-2010 income management no longer applied to entire communities (and hence schools).

schools (10-12). An optional transition year is available before first grade. We restrict the sample to students enrolled in grades 1-12. Our final data set is an unbalanced panel of 9,162 students attending 130 different schools. There are approximately 200 school days in each calendar year and altogether we have more than 3.5 million student-day observations.

## **4.2 Student and Community Characteristics**

Statistics on attendance and mobility for the students in our sample highlight three important stylized facts (see Table 2). First, school attendance is persistently low. Second, the vast majority of students reside in very remote areas that are characterized by significant economic disadvantage. Third, students are highly mobile.

Specifically, the average attendance rate is only 63.7 (57.9) percent for primary (secondary) students living in income-managed communities over the sample period. In comparison, the attendance rate is 86 percent for the rest of the Northern Territory during the same period. Non-attendance is a significant social concern. A major report on Aboriginal schooling in the Northern Territory found that students attending less than 80 percent of the time were at high risk of not meeting minimum standards for literacy and numeracy (Wilson, 2013). More generally, the attendance gap between Aboriginal and non-Aboriginal students contributes to disparities in academic achievement and attainment. Biddle (2014), for example, finds that 20 percent of the gap in PISA test scores between Aboriginal and non-Aboriginal students can be explained by attendance.

Table 2 also highlights the significant degree of mobility within this population. Between 38.6 and 40.5 percent of primary students experience at least one move in each year. Mobility is even higher for secondary students. This reflects the high degree of mobility of Aboriginal people generally in the Northern Territory. Later we consider mobility as a potential mechanism for changes in attendance.

Finally, note that the majority of students in our sample are enrolled in primary school (years 1-6). This is in part because there are more compulsory year levels in primary education. It also reflects the fact that enrollment drops sharply with age in remote Aboriginal communities (Wilson, 2013). The marked increase in secondary students over the period is driven by the cohort restrictions in the data – students born in or after 1994 are at most 12 years old in 2006 and are too young for middle school. By 2009 a much larger proportion of students have aged into secondary education.

Table 2: Sample Statistics for School Attendance Data: Communities Selected for Income Management

	<i>Primary students<sup>a</sup></i>				
	2006	2007	2008	2009	All years
Attendance rate <sup>b</sup> (%)	63.17	64.00	62.69	64.95	63.73
Moved <sup>c</sup> (%)	40.50	38.55	40.14	39.42	58.12
N Students	4,682	4,877	5,007	5,236	8,491
	<i>Secondary students</i>				
	2006	2007	2008	2009	All years
Attendance rate (%)	63.16	60.77	56.92	56.16	57.91
Moved (%)	49.21	50.69	51.69	53.95	67.22
N Students	378	1,014	1,658	2,037	2,660

Notes: Data are from the NT Department of Education administrative records and the reported statistics are based on the authors' calculations. The sample includes students born from 1994 enrolled in schools administered by the NT Department of Education operating in communities selected for income management.

<sup>a</sup> Primary students are those enrolled in grades 1-6. Secondary students are in grades 7-12.

<sup>b</sup> The attendance rate is the sum of student-day observations where the student attended school the whole day divided by the number of student-day observations where the student was expected to attend school.

<sup>c</sup> Moved is an indicator variable for if at any time during the period the student changed his/her enrollment to a school into a different community (intra-community school changes are excluded) or left/joined the NT administrative dataset (which include interstate moves or moves between the private/public sector). Students are counted as having left if they exit the dataset for at least six months. Students are counted as having joined if they first enter the dataset or return to the dataset after an absence of at least six months. Students who join the sample in grade 1 or exit the sample in grades 11 or 12 are not included in this calculation.

Turning to community characteristics, first note that 93.3 percent of the schools in our sample are in areas classified as 'very remote' by the Australian Bureau of Statistics (based on distance to urban centres). The remainder are classified as 'remote'. To put this in perspective, less than one percent of the 2006 Australian population resided in very remote areas (ABS, 2008). All schools in our sample, except one, qualify for remote area benefits offered by the NT Department of Education to attract teachers. Fully, 61.3 percent of schools qualify for the highest award.

A comparison of community characteristics highlights the economic and social disparities between remote Aboriginal communities and the rest of Australia (see Table 3). The children in our sample come from small (mean population = 428), geographically disparate communities (see also Figure 2). The average median age is much lower in our sample than in the rest of Australia and there are also substantial disparities in terms of labor force participation, employment and income, and household size. Our descriptive statistics also reveal considerable heterogeneity across communities, in particular in labor force statistics and language use. On average, only 17.2 percent of

households in income-managed communities speak English exclusively at home.<sup>14</sup>

Table 3: Characteristics of Communities Selected for Income Management Compared to the Australian General Population

Variable	Aus. Pop.	Sample			
	Mean	Mean	St. Dev.	Min	Max
Population	-	428.27	361.04	83	1904
Male (%)	49.4	48.57	3.28	40.87	56.52
Median age (years)	37	22.09	2.16	18	27
English only language spoken at home (%)	78.5	17.23	22.60	0	94.38
Labor force participation rate (%)	64.6	37.78	16.23	6.90	83.50
Employment rate (%)	94.8	86.00	15.91	9.22	100
Median personal income (\$AUD)	466	209.82	39.93	148	466
Average people per household	2.6	6.08	1.43	3.3	9.6

Notes: Data are from the 2006 Australian Census. For the sample characteristics, N=64 in the case of population and percentage males. N=55 for all other variables. Community data are for the Indigenous Local Area for that community. For the missing observations, a suitably granular spatial unit could not be identified in the Census data.

## 5 Estimation Strategy

### 5.1 Event Study Analysis

We begin by analyzing the effect of income management using an event study model. Specifically, we estimate the following model:

$$Y_{ist} = \alpha + \sum_{d=-365}^{365} \pi_i \mathbf{1}(\tilde{\tau}_{st} = d) + \gamma_s + \epsilon_{ist} \quad (1)$$

where  $Y_{ist}$  is an indicator of whether student  $i$  in school  $s$  attended school for the whole day on school-day  $t$  and  $\tilde{\tau}_{st}$  is the “event date” which measures the number of days since the introduction of income management. For example,  $\tilde{\tau}_{st} = 1$  if income management was rolled out one day ago;  $\tilde{\tau}_{st} = 2$  if it was rolled out two days ago and so on. We restrict our data to the one-year window on either side of the implementation date implying that all communities are equally represented and sufficient observations are retained to examine pre- and post-implementation trends. Note this does not mean we have a strictly balanced panel; school holidays and weekends create gaps in the data

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<sup>14</sup>Many Aboriginal languages are spoken across the Northern Territory; English is often the second language.

such that for some  $t$  only a subset of schools identify the coefficient.<sup>15</sup> Finally,  $\gamma_s$  captures school fixed effects,  $E_{ist}$  is a stochastic error term and the remaining variables are parameters to be estimated.

The main purpose of the event study analysis is to directly evaluate the validity of our identification assumption through a careful examination of the pattern in event-date coefficients (see Hoynes & Schanzenbach, 2009). If the introduction of income management is unrelated to trends in school attendance, then we would expect to see no systematic trend in our event-date coefficients prior to the introduction of income management. At the same time, a discontinuous change in attendance patterns that coincides with the introduction of income management is consistent with income management having a causal effect.

## 5.2 Difference-in-Difference Estimation

Our baseline model is a difference-in-difference estimator that effectively uses communities that receive income management later as a control group for those receiving income management earlier. The estimation equation is as follows:

$$Y_{isldt} = \alpha + \beta IM_{isldt} + \gamma_s + \tau_t + \lambda_l + \delta_d + \epsilon_{isldt} \quad (2)$$

where  $Y_{isldt}$  is an indicator of whether student  $i$  in school  $s$  enrolled in grade  $l$  attended school for the whole day on school-day  $t$  on day of the week (e.g. Monday)  $d$ . Moreover,  $IM_{isldt}$  is an indicator variable that equals one if the student is enrolled in a school that is located in a community in which income management has commenced and equals zero otherwise. The model also accounts for school ( $\gamma_s$ ), day-of-the-week ( $\delta_d$ ), grade-level ( $\lambda_l$ ) and time (in days) ( $\tau_t$ ) fixed effects. Importantly, the inclusion of daily fixed effects in Eq. 2 effectively controls for a nonparametric time trend in attendance. Finally,  $E_{isldt}$  is a stochastic error term and the remaining variables are parameters to be estimated. Our main interest is in  $\hat{\beta}$  which captures the effect of income management on

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<sup>15</sup>For example, if income management is introduced on a Monday for school  $s$ , then there is no observation for  $\tilde{\tau}_{st} = -1$  for that school as no student is expected to attend school on a Sunday.

the probability of attending school. This has a causal interpretation if the standard conditional independence assumption holds; that is, if – conditional on the other controls in the model – the introduction of income management is unrelated to trends in school attendance rates.

Our review of the administrative process underlying the introduction of income management along with the lack of an empirical relationship between community characteristics and the onset of income management give us confidence that the roll-out of income management is not related to attendance patterns (see Section 2.2). Nevertheless, we relax our identification assumption by adopting a less-flexible parametric specification for our time fixed effects and allowing the time trend in attendance to vary at the school level. Specifically, we also estimate the following model

$$Y_{islndt} = \alpha + \beta IM_{islndt} + t + \gamma_s + \rho_n + \rho_n \gamma_s + \lambda_l + \delta_d + \epsilon_{islndt} \quad (3)$$

which accounts for a linear time trend  $t$ , school-level fixed effects, fixed effects for the four school terms each year ( $\rho_n$ ), and an interaction between the latter two. Other variables are as defined in Eq. 2. This specification is particularly appealing since school-terms coincide with seasons in the Northern Territory, allowing us to control for seasonal patterns in attendance at the school level. In Eq. 3, both the level of and term-specific trends in attendance are allowed to vary across schools.

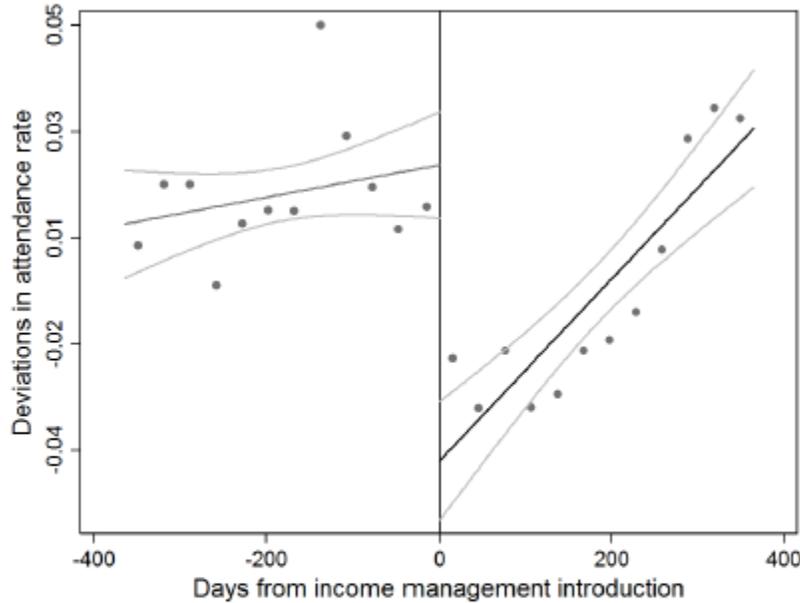
## 6 Results

### 6.1 Attendance

To establish the validity of the maintained assumptions underpinning the difference-in-difference (DD) method, we first present the estimation results obtained from the event study model (Eq. 1). The estimation of Eq. 1 results in separate estimated coefficients for each of 717 different event-days for which attendance is measured. These coefficients effectively capture daily changes in attendance levels in the lead up to and following the introduction of income management. In Figure 3, we plot these coefficients and fit linear trends before and after the introduction of income management. To suppress the degree of noise inherent in the daily data we group these coefficients into bins of

roughly one month.

Figure 3: Event Study Coefficients for School Attendance



There is little evidence of any systematic trend in school attendance prior to the introduction of income management (see Figure 3). Certainly, there is no evidence to suggest that school attendance was falling in the lead up to income management; if anything the trend was upwards. At the same time, we observe a discontinuous drop in attendance that occurs precisely at the onset of income management. Attendance rebounds quickly, however, returning to baseline levels in about six to 12 months. These results support the validity of our identification strategy and point to an adverse effect of income management on attendance, counter to the policy’s aims.<sup>16</sup>

We turn now to the results of our difference-in-difference estimation (Eqs. 2 and 3). We present four different specifications: Model 1 has no control variables and is thus a more parsimonious

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<sup>16</sup>Another common approach for testing the exogeneity of policy timing is to estimate a ‘pseudo policy effect’. We are constrained by the fact our data only go back to 2005. However, we calculate pseudo policy effects by assuming that income management was introduced two years before it in fact was and re-estimating all models over the period 2005-2007 (inclusive), giving us just under one year of pre-policy observations. Results from this exercise (available on request) reveal no consistent evidence of a pseudo policy effect, which supports our identification strategy.

specification of Eq. 2; Model 2 includes control variables; Model 3 is an exact reflection of Eq. 3; and Model 4 adds a full set of interactions between i) school fixed effects, ii) school-term fixed effects, and iii) a linear time trend. Finally, since our event study results point to a dynamic effect of income management on attendance – namely a short-run decrease and subsequent return to trend – we also estimate Models 1 - 4 allowing the treatment effect to vary with days elapsed since the onset of income management. Specifically, we control for separate indicators for the introduction

Table 4: The Effect of Income Management on School Attendance: OLS Regression Results

	(1)	(2)	(3)	(4)
<i>Panel A: Single treatment identifier</i>				
Treatment	-0.015*** (0.003)	-0.021*** (0.004)	-0.018*** (0.003)	-0.018*** (0.003)
<i>Panel B: Treatment effect by time since income management commenced</i>				
<30 days ago	-0.037*** (0.004)	-0.011** (0.004)	-0.020*** (0.004)	-0.020*** (0.004)
30-59 days ago	-0.034*** (0.004)	-0.021*** (0.005)	-0.031*** (0.004)	-0.029*** (0.004)
60-89 days ago	-0.052*** (0.005)	-0.033*** (0.005)	-0.041*** (0.005)	-0.038*** (0.005)
90-119 days ago	-0.054*** (0.004)	-0.031*** (0.006)	-0.032*** (0.005)	-0.030*** (0.005)
120-149 days ago	-0.041*** (0.004)	-0.027*** (0.006)	-0.021*** (0.005)	-0.019*** (0.005)
150+ days ago	-0.006** (0.003)	-0.005 (0.007)	-0.003 (0.004)	-0.005 (0.004)
School FE		Y	Y	Y
Time FE		Y		
Time trend			Y	Y
School-Term FE			Y	Y
School×Term			Y	Y
School×Time trend				Y
Time trend×Term				Y
School×Term×Time trend				Y
Grade FE		Y	Y	Y
Day of the week FE		Y	Y	Y
N	3575294	3575294	3575294	3575294
R <sup>2</sup>	0.001	0.092	0.094	0.101

Notes: Cluster robust (student level) standard errors reported in parenthesis. The dependent variable is an indicator for if the student attended school for the whole day at time  $t$ . The estimation sample is an unbalanced panel of all students in grades 1-12 enrolled in the NT public education system during the period 2006-2009 (inclusive). The full set of available controls include school fixed effects, time fixed effects (day level), a linear time trend, grade fixed effects (grades 1-12), day of the week fixed effects (Monday-Friday) and school-term fixed effects. There are four school terms per year; in 2007 the school terms were as follows: term 1 – 29 January-5 April; term 2 – 16 April-22 June; term 3 – 23 July-28 September; and term 4 – 8 October-14 December. These dates are similar for other years. Panel A and Panel B are the results of separate OLS regressions. \*,\*\* and \*\*\* is statistical significance at the 10%, 5% and 1% level respectively.

of income management less than 30 days ago, 30-59 days ago, 60-89 days ago, 90-119 days ago, 120-149 days ago and 150+ days ago. Results from models with an aggregate treatment effect are in Panel A of Table 4; estimates from models with dynamic treatment effects are in Panel B.

We find that income management reduced school attendance by 1.8 percentage points (ppts) (see Panel A). As our data cover approximately 1.5 years after the introduction of income management, this can be interpreted as the estimated average treatment effect over the short- to medium-term. The result is remarkably stable across specifications. Interestingly, results from Model 1 (no controls) are close to results from the difference-in-difference estimators, implying that school fixed effects and controls for time trends are not overly important in driving the policy effect.

Results in Panel B indicate that the average effect masks important dynamics in attendance behavior. The response in attendance follows a U-shaped pattern. In the immediate 30 days after income management, school attendance is estimated to fall by a statistically significant 1-2 ppts. The decrease in attendance (3-4 ppts) is greatest 60-89 days after income management is introduced, while there is no statistical difference in attendance 150+ days post income management. The average effect in the first five months is 2.7 ppts. Taken together, our results indicate that income management caused a reduction in school attendance in the short-term. In the medium-term attendance recovered but never beyond the baseline trend.

To put our results in perspective, note that a 2.7 ppts reduction in the probability of attendance over the first five months translates to 2.3 additional absences over that period. Hancock et al. (2013) argue that ‘every day counts’ in the sense that there is a strictly decreasing relationship between attendance and academic achievement in Australia. On this basis, it is possible that income management may have negatively affected student achievement. However, given the gradients estimated in Hancock et al. (2013) it is also likely this effect was modest.

## **6.2 Heterogeneity by Gender and School Level**

There are many reasons to believe that the effect of income management on attendance may vary with students’ gender and grade level. Aboriginal boys are less likely to be attending school regularly and have lower levels of educational achievement (test scores) and attainment than do Aboriginal

girls. Biddle and Meehl (2016) argue that differences in the way that men and women experience discrimination, high incarceration rates among Aboriginal men, and the near absence of job opportunities for uneducated Aboriginal women all contribute to the gender gap in educational outcomes for Aboriginal children.

Moreover, educational disparities are much starker among high school students, particularly in remote Aboriginal communities. A 2003 review of secondary education in the Northern Territory, for example, pointed to the large number of Aboriginal adolescents in remote areas not participating in education at all, noting that “the review team doubts that what is being delivered meets acceptable criteria for secondary education” (Ramsey, 2003, p. 164). A decade later, a subsequent review recommended that secondary education in remote and very remote schools be progressively relocated to urban areas with students accommodated in residential facilities (Wilson, 2013).

We investigate whether income management has heterogeneous effects on school attendance by estimating our preferred specification (Model 4) separately for: i) boys versus girls; and ii) primary (years 1-6) versus secondary (years 7-12) students. It is important to note that because we only observe students born in 1994 or later, the results for secondary school are largely driven by students in lower grade levels. Results are reported in Table 5.

We find that the relationship between income management and attendance is similar for boys and girls. In both cases, the impact of income management on attendance follows a U-shaped pattern; attendance first falls, then rebounds and after 150 days becomes statistically indistinguishable from its initial level. The largest downturn in attendance occurs between 60 - 89 days after the introduction of income management and the drop is slightly deeper for boys (4.8 ppts) than girls (2.9 ppts). There is more evidence of heterogeneity across school level, with income management having a much larger effect on the attendance of secondary school students. Most concerning, the policy continues to have a negative and relatively large (1.9 ppts) effect on attendance after 150+ days, though this effect is only significant at 10%. This is suggestive evidence that income management may have had an ongoing harmful effect on the attendance of secondary school students.

Table 5: The Effect of Income Management on School Attendance by School Level and Gender: OLS Regression Results

	Males	Females	Primary	Secondary
<30 days ago	-0.022*** (0.005)	-0.019*** (0.006)	-0.017*** (0.004)	-0.030** (0.009)
30-59 days ago	-0.034*** (0.006)	-0.024*** (0.006)	-0.022*** (0.005)	-0.055*** (0.010)
60-89 days ago	-0.048*** (0.006)	-0.029*** (0.007)	-0.036*** (0.005)	-0.050*** (0.011)
90-119 days ago	-0.038*** (0.006)	-0.022*** (0.007)	-0.028*** (0.005)	-0.040*** (0.011)
120-149 days ago	-0.015** (0.006)	-0.023*** (0.007)	-0.015** (0.005)	-0.030** (0.011)
150+ days ago	-0.004 (0.006)	-0.007 (0.006)	0.000 (0.004)	-0.019* (0.010)
N	1837224	1738070	2921087	654207
R <sup>2</sup>	0.111	0.098	0.097	0.129

Notes: Cluster robust (student level) standard errors reported in parenthesis. All results are based on OLS estimation of the extended version of Eq. 3. The dependent variable is an indicator for if the student attended school for the whole day at time  $t$ . The regression includes a full set of interactions between i) school fixed effects, ii) school-term fixed effects, and iii) a linear time trend (see Model 4 of Table 4), for the relevant sub-sample of students. The estimation samples come from an unbalanced panel of all students in grades 1-12 enrolled in the NT public education system during the period 2006-2009 (inclusive). \*, \*\* and \*\*\* is statistical significance at the 10%, 5% and 1% level respectively.

## 7 Potential Mechanisms

Policy makers had hoped that that income management would redirect household spending away from goods and services that can cause social harm and towards goods and services that are good for child welfare. The belief was that this would increase school engagement by improving children's health and safety; increasing parents' attentiveness; and reducing financial harassment.

Our results, however, indicate that income management reduced attendance in the short-term. In what follows, we investigate the potential mechanisms underlying this result. Specifically, we

consider the extent to which our results reflect: i) the introduction of the NTER more broadly; ii) changes in student enrollments; iii) changes in student mobility; and iv) the way that income management was implemented. Overall, we find no support for the first three of these explanations. However, we do find evidence that implementation issues may have been responsible for the temporary downturn in school attendance following the introduction of income management.

## **7.1 Other NTER Measures**

Income management was introduced into a fluid and rapidly changing policy environment. Many other programs, including store licensing, child health checks, additional police support and various infrastructure projects, were also rolled out to Aboriginal communities as part of the NTER (see Table 2). One possibility is that, rather than identifying the effects of income management per se, our results instead capture the effects of one or more of these other programs. While we cannot rule this out theoretically, we believe it is unlikely for several reasons.

First, the introduction of other NTER measures did not coincide with the roll-out of income management which began in September of 2007 and was 94.0 percent completed by July 2008. Specifically, we document the cumulative coverage of the other key NTER measures across communities over the period July 2007 to July 2008 in Table 6. Alcohol restrictions were commonplace in remote communities even before 2007. The NTER introduced additional bans on alcohol and pornography that became effective almost immediately. These bans were in place in 88 percent of communities before income management began. In contrast, extra police and related measures were introduced into only a small number of communities during the period that income management was being rolled out. Their introduction largely occurred later. Amongst all other NTER measures, the school nutrition program seems to have the time-line that is most similar to that of income management. However, it is difficult to envisage how school nutrition programs would have reduced attendance. They provided an incentive for children to attend school, although Yu et al. (2008) find no empirical evidence of improved attendance when comparing a sample of schools that were early as opposed to late recipients of the school nutrition program.

Table 6: Number of Communities (Proportion of Total Selected) to Receive Major NTER Measures July 2007–July 2008

Measure	Jul-Sep 2007	Oct-Dec 2007	Jan-Mar 2008	Apr-Jul 2008
<i>Welfare reform and employment</i>				
Income management	4 (4.8)	23 (27.7)	33 (39.7)	78 (94.0)
Store license	2 (3.7)	8 (14.8)	18 (33.3)	54 (100.0)
RAEs lifted	15 (23.0)	65 (100.0)	65 (100.0)	65 (100.0)
CDEP transition	3 (3.6)	30 (36.1)	30 (36.1)	30 (32.5)
CEBs	25 (35.6)	38 (53.4)	54 (76.7)	69 (83.1)
<i>Education and child health</i>				
Child health checks	22 (26.5)	48 (57.8)	69 (83.1)	81 (97.6)
School nutrition	3 (4.4)	7 (9.6)	25 (34.2)	68 (93.2)
Accelerated literacy	0 (0.0)	0 (0.0)	0 (0.0)	30 (81.1)
Quality teacher package	0 (0.0)	0 (0.0)	0 (0.0)	34 (85.0)
<i>Law and order</i>				
Banning alcohol	73 (88.0)	83 (100.0)	83 (100.0)	83 (100.0)
Banning pornography	73 (88.0)	83 (100.0)	83 (100.0)	83 (100.0)
Night patrols	0 (0.0)	0 (0.0)	1 (2.2)	14 (39.1)
Extra police	6 (8.2)	12 (16.4)	16 (21.9)	17 (23.3)
THEMIS police station	6 (8.2)	12 (16.4)	16 (21.9)	17 (23.3)
<i>Family support</i>				
Safe house	0 (0.0)	0 (0.0)	0 (0.0)	10 (13.7)
RAFCW	0 (0.0)	0 (0.0)	0 (0.0)	12 (14.4)
Child special services	0 (0.0)	0 (0.0)	0 (0.0)	12 (14.4)
<i>Housing and land</i>				
Leases	27 (39.7)	27 (39.7)	65 (95.6)	68 (100.0)
All CCU works completed	0 (0.0)	0 (0.0)	0 (0.0)	72 (98.6)
<i>Governance</i>				
GBMs	12 (14.8)	67 (82.7)	81 (100.0)	81 (100.0)

Source: Yu et al. (2008). Figures for each quarter are the cumulative number of communities that received the measure by the end of that quarter. The percentage of communities to have received the measure relative to the target number of communities is in parenthesis. For details on each measure see Table 2.

Second, our event study analysis indicates that our results are capturing the effects of income management rather than other components of the NTER. The decrease in school attendance occurs precisely at the point that income management is introduced into each community (see Figure 3). Given that the introduction of other key NTER measures did not coincide with the roll-out of

income management, they do not provide a compelling explanation for this result. Moreover, any aggregate response to the NTER overall, for example driven by collective sentiment, is captured by the time fixed-effects included in Eq. 2.

For both reasons, we believe that our results are unlikely to be explained by confoundedness with the introduction of other key NTER measures.

## **7.2 Enrollment**

Although school enrollment is mandatory until age 17 in the Northern Territory, in practice many children living in the remote Aboriginal communities are not enrolled in school (Wilson, 2013). In this section we explore whether the reduction in school attendance that occurred after the introduction of income management can be linked to changes in school enrollment. To the extent that income management led to safer, healthier, and more stable environments for children, it may also have had a beneficial effect in raising school enrollment rates. At the same time, enrollment rates may have also increased as a result of the initial uncertainty about whether income management would or would not be linked to children's lack of school participation. In particular, the July 2007 legislative amendments to enact income management include provisions that allow for the quarantining of up to 100 percent of welfare payments for families in which children are not maintaining an acceptable level of school attendance; though for several reasons this has never been enforced in practice (Yu et al., 2008). Nonetheless, some families may have moved to enroll students in school in the expectation that they would lose their benefits if their children were not attending school. In this case, the decline in attendance that we observe post income management might be due to a negative selection effect. That is, income management may have encouraged students who were previously un-enrolled – and who may have a lower propensity to attend – to enroll in school.

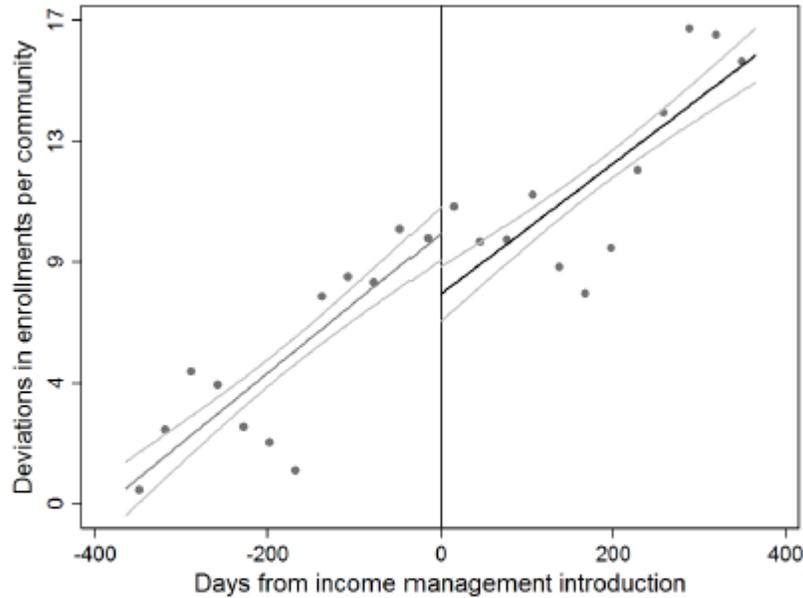
We observe the total number of students enrolled in each school on each day.<sup>17</sup> If income management influenced enrollment decisions, then we should see an increase in student numbers following its introduction. To investigate this, we re-estimate our event study model (Eq. 1)

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<sup>17</sup>We do not observe enrollment rates because we do not observe the number of children in the community.

focusing on the number of enrolled students in community  $c$  at time (day)  $t$  ( $d$ ). As before, we obtain estimates of our event-time indicators which identify deviations in the number of enrolled students relative to the omitted period ( $\bar{t}_{ct} = -365$ ) and plot these against the onset of income management. The results are in Figure 4.

Figure 4: Event Study Coefficients for Number of Students Enrolled in Income Managed Communities



Notes: Results are based on OLS estimation of the same form as Eq. 1 using observations between  $\pm 365$  days from the onset of income management in each community. The dependent variable is the number of students enrolled in schools located in community  $c$  on school-day  $t$ . The regression controls for community fixed effects and separate indicators for each event-date (i.e. time until/since income management commenced). Due to school holidays and weekends, some event-dates have no observations such that the number of separate indicators is 717. Scatter points correspond to coefficients on the event-date dummies in Eq. 1. These are binned into 12 groups (approximately one month) each side of the implementation date. The reference period is  $\bar{t}_{ct} = -365$  and deviations in the average number of enrolled students are relative to the average number of enrolled students on this date. Linear trend lines and 95% confidence intervals through these points are also shown.

Enrollment appears to be increasing with time. However, this is in part due to the fact that our data only capture students born in 1994 or later. By 2009, these students are still yet to age-out of the education system, which means that students entering grade 1 each year are not offset by students exiting secondary education. The slope of the trend in Figure 4 should therefore be interpreted with caution. What is important for our analysis is whether there is a systematic discontinuous change in enrollments that coincides with the onset of income management. There is no strong evidence of such an effect. While the fitted linear trend lines give the perception of a small jump in enrollments, this is driven by less stable event-date coefficients further away from the onset of income management. Importantly, between  $\pm 150$  days around the introduction of income management there is a stable trend in enrollment. Overall, there is no indication income

management influenced school enrollments, making it unlikely that changes in school enrollments explain the estimated reduction in attendance.

### **7.3 Geographic Mobility**

Geographic mobility is high in Northern Territory Aboriginal communities – families frequently relocate for social and cultural reasons, including ceremonies and the maintenance of kinship (Memmott et al., 2006). Income management may have been a barrier to geographic mobility since, before they left their home communities, people needed to contact Centrelink to organize a way of accessing their benefits while they were away (AIHW, 2010). In theory, it is also possible that geographic mobility increased in anticipation of income management as people tried to avoid the policy. In practice, however, this is unlikely to be empirically important as virtually all Aboriginal communities were ultimately subject to income management. In order to avoid the policy, people would have had to leave Aboriginal land altogether. Moreover, once income management commenced in a community, people living in that community were still subject to income management even if they moved away.

If the onset of income management altered mobility patterns, our results could again be reflecting a selectivity effect as children with higher attendance rates disproportionately leave Aboriginal communities (or children with lower attendance rates disproportionately stay). We explore the pattern in geographic mobility using data from the entire Northern Territory and categorizing schools by whether they are located in income-managed communities or not. Geographic mobility is measured by identifying students who change schools across communities (intra-community school changes are not counted as moves) allowing us to focus on the dynamics of in- and out-migration in income-managed communities. In-migration is the number of students joining community  $c$  on day  $t$ ; this includes students moving from other income-managed communities; other non income-managed communities; or from outside our administrative data set (e.g. interstate moves or moves between the private and public education sectors). Out-migration is reverse of these. The most common type of move is from one income-managed community to another (56.2 percent of moves within the Northern Territory in 2008). Moves i) from income-managed to non income-managed communities and ii) from non income-managed to income-managed communities account for a

roughly even share of the remaining 43.8 percent of moves within the Northern Territory. Finally, of the 6,665 students enrolled in schools in income-managed communities in 2008 approximately 17.5 percent either entered or exited our administrative data system.

Our approach to analyzing the mobility data is similar to that used for studying enrollments. That is, we estimate event study models of the same form as Eq. 1 focusing on in- and out-migration (as a fraction of student enrollment) at the community rather than individual level. As previously, we plot the event-day coefficients against time since the onset of income management. This allows us to assess whether there are any changes in mobility patterns that coincides with the introduction of income management.

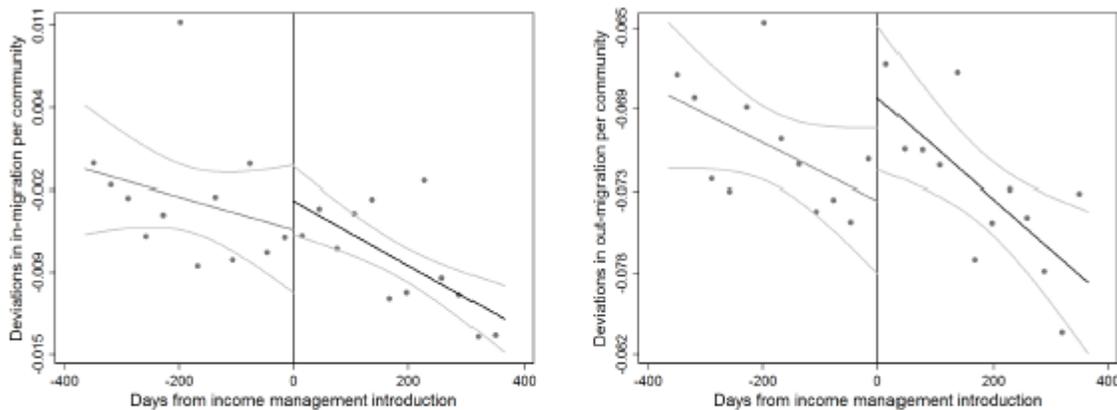
In Figure 5 we plot the relationship between time since the onset of income management and the rate of in-migration (left) and out-migration (right).<sup>18</sup> The Y-axis is the deviation in the relevant mobility rate with  $\bar{t}_{st} = -365$  set as the reference period. Focusing first on in-migration, we find no clear pattern in the data and certainly no evidence that mobility changes around the onset of income management. There is some indication of a small increase in the rate of out-migration around the time income management commenced. However, there is also considerable variability in the data and this result is not significant. Overall, Figure 5 provides no strong evidence that student mobility was affected by income management.

Although overall mobility into and out of income-managed communities seems to be unaffected by the introduction of income management, it is possible that the composition of the migration flow was affected. Specifically, in- and out-migrants may have become more or less selected with respect to their propensity to attend school. We address this issue by focusing our attention on those with a low propensity to move; i.e., the 41.9 percent of students who made no geographic moves between 2006 and 2009. We estimate our main models using this sub-sample of students and, for brevity, report the results in Appendix A (Table A1). Despite the smaller sample size, we find the same substantive results; there is a short-run reduction in attendance of up to 2.9 ppts and no effect on attendance after 150 days. We conclude that changes in mobility patterns are unlikely to explain the drop in school attendance as income management was introduced.

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<sup>18</sup>We also conduct an event study analysis of the total mobility rate (i.e. in-migration + out-migration divided by enrollments). We find no evidence that the onset of income management affected total mobility. Results are available upon request.

Figure 5: Event Study Coefficients for Student Movement Into/Out of Income Managed Communities



Notes: Results are based on OLS estimation of the same form as Eq. 1 using observations between  $\pm 365$  days from the onset of income management in each community. For the left graph, the dependent variable is the total number of students moving into the community divided by the number of students already enrolled in the community on day  $t$ . Moves into a community include students moving from other income-managed communities; other non income-managed communities; or students joining the administrative data set for the first time or after and absence of at least six months (e.g. interstate moves or moves between the private and public education sector). For the right graph, the dependent variable is the total number of students leaving the community divided by the number of students enrolled in the community on day  $t$ . This is the reverse of moves into a community. The regressions control for community fixed effects and separate indicators for each event-date (i.e. time until/since income management commenced). Due to school holidays and weekends, some event-dates have no observations such that the number of separate indicators is 717. Scatter points correspond to coefficients on the event-date dummies in Eq. 1. These are binned into 12 groups (approximately one month) each side of the implementation date. The reference period is  $\bar{\tau}_{t} = -365$  and deviations in the rate of in-migration/out-migration are relative to the rate on this date. Linear trend lines and 95% confidence intervals through these points are also shown.

## 7.4 Implementation Issues

It is possible that poor implementation of income management, coupled with widespread community dissatisfaction, reduced community engagement with schools. In particular, the introduction of income management was characterized by a lack of consultation with stakeholders, confusion about how the policy would operate, hurdles in accessing welfare benefits, difficulty in checking account balances and increased barriers to moving between local communities. Initially, resources were not sufficient to administer income management and Centrelink found it needed to extend its hours to meet the increase in service demand (FAHCSIA, 2008). In some cases, people experienced a real decrease in purchasing power, at least in the short-term. For example, on 30 November 2007, 22.6 percent of income management clients were having their money defaulted to an income management account, rather than delivered in ways that could be used to purchase priority goods and services (AIHW, 2010). In some cases, the disruption caused by missing payments resulted in children being absent from school as they travelled with their parents to Centrelink offices in regional centers to sort out their benefits.<sup>19</sup>

<sup>19</sup>Personal communication with Olga Havnan, NT Coordinator General for Remote Service Delivery during the Northern Territory Emergency Response (November 22, 2017).

There was also widespread dissatisfaction with the compulsory nature of the policy; many of those directly affected felt that they were unfairly targeted and did not need to be income managed (Yu et al., 2008; AIHW, 2010). Income management also placed constraints on resource sharing within families, which policy makers hoped would reduce the pressure (“humbugging”) on women and the elderly to share their benefits with extended family members (AIHW, 2010). This aspect of the policy was poorly received, however, as remote Aboriginal communities are highly collectivist and resource sharing is an important social institution. Finally, there was a great deal of confusion about whether or not income management would be linked to school attendance and the perception that schools would be supplying enrollment and attendance data to Centrelink may have undermined community-school relations (Kroneman, 2007).

We investigate whether these initial implementation issues are the source of the reduction in school attendance by taking advantage of the introduction of the Basics Card in 2008, a second reform that significantly improved the operation of income management. The Basics Card overcame many of the operational problems associated with income management by allowing clients to use the card to purchase goods and services in the same way as a regular debit card. This eliminated the need for priority goods to be purchased from either nominated community stores or using store cards previously obtained from Centrelink. The Basics Card significantly reduced the transaction costs associated with income management, particularly when travelling outside home communities. It may have also assisted in restoring social capital by allowing family members to pool resources. Although Basics Cards were protected by a personalized identification number (PIN) and clients were told not to share their card or PIN, in practice many people admit to doing both (AIHW, 2010; Bray et al., 2014). Qualitative evidence suggests that people viewed the Basics Card as a substantial improvement in the way income management operated (AIHW, 2010). We posit that, if implementation issues are driving our results, we should see attendance improve after the Basics Card is introduced.

The Basics Card was introduced on September, 8 2008 and was completely rolled out to all income-managed clients by December 15, 2008 three months later. Information on the roll-out schedule for the Basics Card is not available. However, aggregate data on the allocation of income-managed funds imply the roll-out predominately occurred in the first month. Specifically, the

fraction of income-managed funds allocated to store cards dropped from more than 20 to around 5 percent between September 8th and October 10th of 2008, eventually becoming almost zero by the time the roll-out was completed (AIHW, 2010).

We assess whether the introduction of the Basics Card mitigated the negative effect of income management on attendance by including an indicator variable that takes the value one if  $t \geq$  September 8, 2008 (and zero otherwise) (see Table 7).<sup>20</sup> This approach effectively acts as if the Basics Card was introduced across the whole Northern Territory on a single day. While this is not strictly correct, as the Basics Card was rolled-out quite quickly, any bias will be small and attenuate our estimates. We estimate all models allowing the treatment effect to vary with time since implementation.

Our preferred specification is in Column 3; corresponding estimates without the control for the Basics Card can be found in Column 4 of Table 4. School attendance continues to have the same U-shaped response to the introduction of income management. Moreover, the magnitude of our estimates is largely unaffected by the inclusion of the Basics Card indicator, though attendance 150+ days post income management is now estimated to be 1.9 ppts lower which is statistically significant. Critically, attendance rates are estimated to be 1.6 ppts higher following the introduction of the Basics Card. This is consistent with implementation issues being the pathway through which income management resulted in a short-run decrease in school attendance. When the program implementation improved so too did attendance.<sup>21</sup> Nevertheless, the coefficient on the Basics Card is only large enough to offset the initial effects of income management – we find no evidence that the policy ever had a positive effect on attendance.

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<sup>20</sup>This indicator is not identified in Model 2 due to the inclusion of time fixed effects.

<sup>21</sup>We are limited in our ability to conduct placebo tests around the timing of the Basics Card given the single implementation date and unstable policy environment during our study period. Nevertheless, in results available on request, we re-estimated all models with indicators for up to 90 days before the Basics Card commenced. In all cases, estimates indicate that attendance was not increasing in the lead-up to the introduction of the Basics Card.

Table 7: The Effect of Income Management on School Attendance Controlling for Basics Card: OLS Regression Results

	(1)	(2)	(3)
<30 days ago	-0.036*** (0.004)	-0.020*** (0.004)	-0.020*** (0.004)
30-59 days ago	-0.033*** (0.004)	-0.031*** (0.004)	-0.029*** (0.004)
60-89 days ago	-0.049*** (0.005)	-0.043*** (0.005)	-0.041*** (0.005)
90-119 days ago	-0.049*** (0.005)	-0.036*** (0.005)	-0.036*** (0.005)
120-149 days ago	-0.034*** (0.005)	-0.026*** (0.005)	-0.028*** (0.005)
150+ days ago	0.005 (0.006)	-0.011** (0.005)	-0.019*** (0.005)
Basics Card	-0.012** (0.005)	0.010** (0.004)	0.016*** (0.004)
School FE		Y	Y
Time trend		Y	Y
School-Term FE		Y	Y
School×Term		Y	Y
School×Time trend			Y
Time trend×Term			Y
School×Term×Time trend			Y
Grade FE		Y	Y
Day of the week FE		Y	Y
N	3575294	3575294	3575294
R <sup>2</sup>	0.001	0.094	0.101

Notes: Cluster robust (student level) standard errors reported in parenthesis. The dependent variable is an indicator for if the student attended school for the whole day at time  $t$ . The estimation sample is an unbalanced panel of all students in grades 1-12 enrolled in the NT public education system during the period 2006-2009 (inclusive). Basics Card is an indicator for if  $t$  is after this policy was introduced (September 8, 2008). The full set of available controls include school fixed effects, time fixed effects (day level), a linear time trend, grade fixed effects (grades 1-12), day of the week fixed effects (Monday-Friday) and school-term fixed effects. There are four school terms per year; in 2007 the school terms were as follows: term 1 – 29 January-5 April; term 2 – 16 April-22 June; term 3 – 23 July-28 September; and term 4 – 8 October-14 December. These dates are similar for other years. Estimates are obtained by OLS. \*,\*\* and \*\*\* is statistical significance at the 10%, 5% and 1% level respectively.

## 8 Conclusion

Relative to Canada, New Zealand, or the United States, Australia stands out for its use of welfare quarantining as a key strategy in its attempts to enhance the well-being of Indigenous communities. Income management – like conditional cash transfers – is meant to improve social and economic outcomes by reducing access to harmful products and increasing the consumption of beneficial goods and services. Currently, the Australian Government is actively extending its use of income management beyond remote Aboriginal communities in the Northern Territory to communities elsewhere experiencing entrenched disadvantage, young job seekers who fail random drug tests, and people coming in contact with the child protection system, leaving prison, or at risk of homelessness. In some cases, income management is voluntary; in others it is compulsory.<sup>22</sup>

While conditional cash transfer programs have been subjected to rigorous evaluation, there is very little credible evidence regarding the impact of income management on social and economic outcomes. We provide the first causal evidence linking income management to a key policy target – school attendance. In contrast to the policy’s objectives, we find no evidence that school attendance increased after the introduction of income management. In fact, we estimate that attendance fell by 2.7 percentage points on average in the short-run. This drop in attendance does not appear to be due to other contemporaneous social policy initiatives or to changes in either geographic mobility or school enrollment patterns. Rather, we argue that the way that income management was implemented may have resulted in income insecurity, barriers to day-to-day economic activity, and a loss of empowerment which may have led to increased family stress and had adverse consequences for parenting. These findings echo those of Gennetian, Seshadri, et al. (2016), who find that students receiving food stamps have disproportionately more behavioral problems at the end of the month when they are most likely to be subject to food insecurity.

Of course, the failure of income management to improve student attendance does not necessarily rule out other positive social and economic outcomes. Nevertheless, if income

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<sup>22</sup>See [www.dss.gov.au](http://www.dss.gov.au) for more information.

management did meet other key objectives (e.g. increased expenditure on food and education, less substance abuse) then it is puzzling that we do not observe any improvement in school attendance over the study period given the likely link between these outcomes and school engagement. More broadly, the overall trend in school attendance between 2006-2009 suggests that the NTER in general failed to lift attendance rates in remote Aboriginal communities despite the large number of policies targeting this goal (see Appendix B).

Taking a broader perspective, a key take-away message of our research is that program implementation matters. Consistent with Cameron and Shah (2014), our results suggest that policy makers should pay careful attention to the erosion of social capital when implementing new programs. This is particularly true in Aboriginal communities where attempts to reduce disadvantage through increased social mobility may put at risk social and cultural capital (Walter, 2015). Income management also provides an interesting case study for understanding how weak program fidelity may not only undermine the benefits to social welfare reform, but may also have harmful consequences. Of particular concern is the potential for these harmful effects to disproportionately affect vulnerable groups. In particular, we find that the school attendance penalty was somewhat larger for secondary school students who already have disproportionately low attendance rates and Aboriginal boys who are at a particular educational disadvantage.

A key question for policy makers and researchers is whether restricted welfare policies, such as income management, are preferable to regular cash transfers. Few studies compare the relative performance of cash versus in-kind transfers. Yet those that do find little evidence that one mode of delivery is clearly superior to the other when the focus is on food consumption and nutrition (Gentilini, 2016). Our results imply that, with adequate program administration, income management may at best be neutral with respect to student attendance.

At the same time, non-cash transfers are often associated with high administrative costs. The cost of administering income management was \$451 million (AUD) between the 2007-08 and 2009-10 financial years, or approximately \$20,700 per income-managed person.<sup>23</sup> Further

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<sup>23</sup>Figures on the cost of income management are from reported in Buckmaster et al. (2012) based on budget papers available at [www.budget.gov.au](http://www.budget.gov.au). The cost per person is calculated using the total number of persons who had been subjected to income management as of 31 March 2009 (21,763), reported in AIHW (2010).

research is needed to understand whether or not this cost is offset by other social benefits beyond increased school attendance or whether – as some experts have argued (Altman, 2016) – these resources could be redeployed more productively to enhance the wellbeing of Indigenous Australians.

## References

- ABS. (2008). *Australian social trends 2008: Population distribution*. Australian Bureau of Statistics: Canberra.
- AIHW. (2010). *Evaluation of income management in the Northern Territory*. Australian Institute of Health and Welfare: Occasional Paper No. 34.
- Almond, D., Hoynes, H., & Schanzenbach, D. W. (2011). Inside the war on poverty: The impact of food stamps on birth outcomes. *The Review of Economics and Statistics*, 93, 387–403.
- Altman, J. (2016). Blindsided by basics: three perspectives on income management in an Aboriginal community in the Northern Territory. *Australian Journal of Social Issues*, 51, 487–502.
- Al-Yaman, F., Van Doeland, M., & Wallis, M. (2006). *Family violence among Aboriginal and Torres Strait Islander peoples*. Australian Institute of Health and Welfare Canberra: AIHW cat. no. IHW 17.
- Anderson, P. (2016). The intervention: Personal reflections. In R. Scott & A. Heiss (Eds.), *The intervention: An anthology* (2nd ed., pp. 26–39). Sydney: NewSouth Publishing.
- Bailey, M. (2012). Reexamining the impact of family planning programs on US fertility: Evidence from the war on poverty and the early years of Title X. *American Economic Journal: Applied Economics*, 4, 62–97.
- Bailey, M., & Goodman-Bacon, A. (2015). The war on poverty's experiment in public medicine: Community health centers and the mortality of older Americans. *American Economic Review*, 105, 1067–1104.
- Behrendt, L. (2016). The dialogue of intervention. In R. Scott & A. Heiss (Eds.), *The intervention: An anthology* (2nd ed., pp. 61–70). Sydney: NewSouth Publishing.
- Bennet, B., & Green, S. (2016). Is community development equity or justice? In C. Kickett- Tucker (Ed.), *Mia Mia Aboriginal community development: Sustaining cultural security* (pp. 128–141). Cambridge, UK Port Melbourne: VIC Cambridge University Press.
- Biddle, N. (2014). *Developing a behavioural model of school attendance: Policy implications for Indigenous children and youth*. Centre for Aboriginal Economic Policy Research, Working Paper 94/2014.
- Biddle, N., & Meehl, A. (2016). *The gendered nature of Indigenous education participation and attainment*. Centre for Aboriginal Economic Policy Research, Working Paper No. 106/2016.
- Brady, M. (2000). Alcohol policy issues for Indigenous people in the United States, Canada, Australia and New Zealand. *Contemporary Drug Problems*, 27, 435–509.
- Bramley, D., Hebert, P., Jackson, R., & Chassin, M. (2004). Indigenous disparities in disease-specific mortality, a cross-country comparison: New Zealand, Australia, Canada, and the United States. *The New Zealand Medical Journal*, 117, 1–16.
- Bray, J. R., Gray, M., Hand, K., Bradbury, B., Eastman, C., & Katz, I. (2012). *Evaluating New Income Management in the Northern Territory: First evaluation report*. Social Policy Research Centre.
- Bray, J. R., Gray, M., Hand, K., & Katz, I. (2014). *Evaluating New Income Management in the Northern Territory: Final evaluation report*. Social Policy Research Centre.
- Bray, J. R., Gray, M., Hand, K., & Katz, I. (2015). Compulsory income management in the Northern Territory – evaluating its impact. *Australian Journal of Social Issues*, 50, 373–396.
- Brimblecombe, J. K., McDonnell, J., Barnes, A., Dhurrkay, J. G., Thomas, D. P., & Bailie, R. S. (2010). Impact of income management on store sales in the Northern Territory. *Medical Journal of Australia*, 192, 549–554.

- Brough, M. (2007). *Northern Territory National Emergency Response Bill 2007: Second reading speech*. Commonwealth of Australia: House of Representatives.
- Buckmaster, L., Ey, C., & Klapdor, M. (2012). *Income management: An overview*. Department of Parliamentary Services: Parliamentary Library Information Analysis Advice.
- Busso, M., Gregory, J., & Kline, P. (2013). Assessing the incidence and efficiency of a prominent place based policy. *American Economic Review*, 103, 897–947.
- Cameron, L., & Shah, M. (2014). Can mistargeting destroy social capital and stimulate crime? Evidence from a cash transfer program in Indonesia. *Economic Development and Cultural Change*, 62, 381–415.
- Campbell, D., & Wright, J. (2005). Rethinking welfare school-attendance policies. *Social Service Review*, 79, 2–28.
- Cascio, E., Gordon, N., Lewis, E., & Reber, S. (2010). Paying for progress: Conditional grants and the desegregation of southern schools. *Quarterly Journal of Economics*, 125, 445–482.
- Central Land Council. (2008). *Reviewing the Northern Territory Emergency Response: Perspectives from six communities*. Central Land Council.
- Cerna, L. (2013). *The nature of policy change and implementation: A review of different theoretical approaches*. Paris: OECD.
- CIRCA. (2011). *Evaluation of the Community Stores Licensing Program: Final report*. Cultural and Indigenous Research Centre Australia: Commissioned by the Department of Families, Housing, Community Services and Indigenous Affairs: Australian Government.
- Clifford, A. C., Doran, C. M., & Tsey, K. (2013). A systematic review of suicide prevention interventions targeting Indigenous peoples in Australia, United States, Canada and New Zealand. *BMC Public Health*, 13, 1–11.
- Cobb-Clark, D. A. (2013). The case for making public policy evaluations public. In *Better Indigenous policies: The role of evaluation* (pp. 81–91). Roundtable Proceedings, Productivity Commission.
- Cooke, M., Mitrou, F., Lawrence, D., Guimond, E., & Beavon, D. (2007). Indigenous well-being in four countries: An application of the UNDP'S Human Development Index to Indigenous Peoples in Australia, Canada, New Zealand, and the United States. *BMC International Health and Human Rights*, 9, 1–11.
- Cornell, S. (2006). *Indigenous peoples, poverty and self-determination in Australia, New Zealand, Canada and the United States*. Native Nations Institute for Leadership, Management, and Policy: JOPNA No. 2006-02.
- Cross, T. A., Earle, K. A., & Simmons, D. (2000). Child abuse and neglect in Indian country: Policy issues. *Families in Society: The Journal of Contemporary Human Services*, 81, 49–58.
- Currie, J. (2003). US food and nutrition programs. In R. A. Moffitt (Ed.), *Means-tested transfer programs in the United States* (pp. 199–289). Chicago: University of Chicago Press.
- Currie, J., & Gahvari, F. (2008). Transfers in cash and in-kind: Theory meets the data. *Journal of Economic Literature*, 46, 333–383.
- Dee, T.S. (2011). Conditional cash penalties in education: Evidence from the Learnfare experiment. *Economics of Education Review*, 30, 924–937.
- Durlak, J. A., & DuPre, E. P. (2008). Implementation matters: A review of research on the influence of implementation on program outcomes and the factors affecting implementation. *American Journal of Community Psychology*, 41, 327–350.
- Ethridge, M. E., & Percy, S. L. (1993). A new kind of public policy encounters disappointing results: Implementing Learnfare in Wisconsin. *Public Administration Review*, 53, 340–347.
- FAHCSIA. (2008). *Submission of background material to the Northern Territory Emergency Re-*

- sponse Review Board*. Department of Families, Housing, Community Services and Indigenous Affairs: Australian Government.
- FAHCSIA. (2011). *Northern Territory Emergency Response: Evaluation report 2011*. Department of Families, Housing, Community Services and Indigenous Affairs: Australian Government.
- Finkelstein, A., & McKnight, R. (2008). What did Medicare do? The initial impact of Medicare on mortality and out of pocket medical spending. *Journal of Public Economics*, *92*, 1644–1668.
- Fogarty, W., Lovell, M., & Dodson, M. (2015). Indigenous education in Australia: Place, pedagogy and epistemic assumptions. *UNESCO Observatory Refereed e-Journal*, *4*, 1–21.
- Fraker, T. M., Martini, A. P., & Ohls, J. C. (1995). The effect of food stamp cashout on food expenditures: An assessment of the findings from four demonstrations. *Journal of Human Resources*, *30*, 633–649.
- Fraker, T. M., Martini, A. P., Ohls, J. C., & Ponza, M. (1995). The effect of cashing-out food stamps and household food use and the cost of issuing benefits. *Journal of Policy Analysis and Management*, *14*, 372–392.
- Freedman, M. (2013). Targeted business incentives and local labor markets. *Journal of Human Resources*, *48*, 311–344.
- Gennetian, L., Darling, M., & Aber, J. L. (2016). Behavioral economics and developmental science: A new framework to support early childhood interventions. *Journal of Applied Research on Children: Informing Policy for Children at Risk*, *7*, Article 2.
- Gennetian, L., Seshadri, R., Hess, N. D., Winn, A. N., & Goerge, R. M. (2016). Supplemental Nutrition Assistance Program (SNAP) benefit cycles and student disciplinary infractions. *Social Service Review*, *90*, 403–433.
- Gentilini, U. (2016). Revisiting the “cash versus food” debate: New evidence for an old puzzle? *The World Bank Research Observer*, *31*, 135–167.
- Ham, J. C., Swenson, C., Imrohoroğlu, A., & Song, H. (2011). Government programs can improve local labor markets: Evidence from state enterprise zones, federal empowerment zones and federal enterprise community. *Journal of Public Economics*, *95*, 779–797.
- Hancock, K. J., Shepherd, C. C. J., Lawrence, D., & Zubrick, S. R. (2013). *School attendance and educational outcomes: Every day counts*. Report prepared for the Department of Education, Employment and Workplace Relations.
- Herbert, J., McInerney, D. M., Fasoli, L., Stephenson, P., & Ford, L. (2014). Indigenous secondary education in the Northern Territory: Building for the future. *The Australian Journal of Indigenous Education*, *43*, 85–95.
- Hoynes, H., Page, M., & Stevens, A. H. (2011). Can targeted transfers improve birth outcomes? Evidence from the introduction of the WIC program. *Journal of Public Economics*, *95*, 813–827.
- Hoynes, H., & Schanzenbach, D. (2016). US food and nutrition programs. In R. A. Moffitt (Ed.), *Economics of means-tested transfer programs in the United States* (Vol. 1, pp. 219–301). Chicago: University of Chicago Press.
- Hoynes, H., & Schanzenbach, D. W. (2009). Consumption responses to in-kind transfers: Evidence from the introduction of the food stamp program. *American Economic Journal: Applied Economics*, *1*, 109–139.
- Hoynes, H., Schanzenbach, D. W., & Almond, D. (2016). Long-run impacts of childhood access to the safety net. *American Economic Review*, *106*, 903–934.
- Humpage, L. (2016). Income management in New Zealand and Australia: Differently framed but similarly problematic for Indigenous peoples. *Critical Social Policy*, *36*, 551–571.

- Hunter, E., & Harvey, D. (2002). Indigenous suicide in Australia, New Zealand, Canada and the United States. *Emergency Medicine*, 14, 14–23.
- Kroneman, M. (2007). *Education is the key: An education future for Indigenous communities in the Northern Territory*. Melbourne, Australia: Australian Education Union.
- Ladd, H. F. (1994). Spatially targeted economic development strategies: Do they work? *Cityscape*, 1, 193–218.
- Lamb, D., & Young, M. (2011). ‘Pushing buttons’: An evaluation of the effect of Aboriginal income management on commercial gambling expenditure. *Australian Journal of Social Issues*, 46, 119–140.
- Lohoar, S., Butera, N., & Kennedy, E. (2014). *Strengths of Australian Aboriginal cultural practices in family life and child rearing*. Child Family Community Australia Paper No. 25 2014.
- Ludwig, J., & Miller, D. L. (2007). Does head start improve childrens life chances? Evidence from a regression discontinuity design. *Quarterly Journal of Economics*, 122, 159–208.
- Martin, K. L. (2017). Culture and identity: LSIC parents’ beliefs and values and raising young Indigenous children in the twenty-first century. In M. Walter, K. L. Martin, & G. Bodkin-Andrews (Eds.), *Indigenous children growing up strong: A longitudinal study of Aboriginal and Torres Strait Islander families* (pp. 79–99). London: Palgrave Macmillan.
- Matheson, D., & Hardie-Boys, N. (2011). *Evaluation of the child health check initiative and the expanding health service delivery initiative: Final report*. Report to the Department of Health and Ageing: Allen and Clarke Policy and Regulatory Specialists.
- McTaggart, R. (1991). Western institutional impediments to Australian Aboriginal education. *Journal of Curriculum Studies*, 23, 297–325.
- Medgyesy, M., & Temesváry, Z. (2013). *Conditional cash transfers in high-income OECD countries and their effects on human capital accumulation*. GINI Discussion Paper 84.
- Meier, K. J., & McFarlane, D. R. (1995). Statutory coherence and policy implementation: The case of family planning. *Journal of Public Policy*, 15, 281–298.
- Memmott, P., Long, S., & Thomson, L. (2006). *Indigenous mobility in rural and remote Australia*. Australian Housing and Urban Research Institute Final Report No. 90.
- Memmott, P., Stacy, R., Chambers, C., & Keys, C. (2001). *Violence in Indigenous communities*. Report to Crime Prevention Branch of the Attorney-Generals Department: Canberra.
- Mendes, P., Waugh, J., & Flynn, C. (2014). Income management in Australia: A critical examination of the evidence. *International Journal of Social Welfare*, 23, 362–372.
- Muir, N., & Bohr, Y. (2014). Contemporary practice of traditional Aboriginal child rearing: A review. *First Peoples Child and Family Review*, 9, 66–79.
- Neumark, D., & Kolko, J. (2010). Do enterprise zones create jobs? Evidence from California’s enterprise zone program. *Journal of Urban Economics*, 68, 1–19.
- Neumark, D., & Simpson, H. (2015). Place-based policies. In G. Duranton, J. V. Henderson, & W. Strange (Eds.), *Handbook of regional and urban economics* (Vol. 5, pp. 1198–1287). Elsevier.
- Ramsey, G. (2003). *Report on future directions for secondary education in the Northern Territory*. Charles Darwin University and NT Department of Employment, Education and Training: Report to the Northern Territory Government.
- Rawlings, L. B., & Rubio, G. M. (2005). Evaluating the impact of conditional cash transfer programs. *The World Bank Research Observer*, 20, 29–55.
- Reynolds, C. L., & Rohlin, S. (2015). The effects of location-based tax policies on the distribution of household income: Evidence from the federal empowerment zone program. *Journal of Urban Economics*, 88, 1–15.

- Riccio, J., Dechausay, N., Miller, C., Nuñez, S., Verma, N., & Yang, E. (2013). *Conditional cash transfers in New York City: The continuing story of the Opportunity NYC-Family Rewards Demonstration*. MDRC Report.
- Sinha, V., Trocmé, N., Fallon, B., MacLaurin, B., Fast, E., Prokop, S. T., ... Richard, K. (2011). *Kiskisik awasisak: Remember the children understanding the overrepresentation of first nations children in the child welfare system*. Ontario: Assembly of First Nations.
- Slavin, R. E. (2010). Can financial incentives enhance educational outcomes? Evidence from international experiments. *Educational Research Review*, 5, 68–80.
- SPRC. (2010). *Evaluation framework for New Income Management (NIM)*. Social Policy Research Centre: Prepared for the Australian Government Department of Families, Housing, Community Services and Indigenous Affairs.
- Stanley, J., Tomison, A. M., & Pocock, J. (2003). *Child abuse and neglect in Indigenous Australian communities*. Australian Institute of Family Studies: NCPC Issues No. 19.
- Taylor, A., & Dunn, B. (2010). Conceptualising and measuring the mobility of Indigenous students in the Northern Territory. *The Australian Journal of Indigenous Education*, 39, 88–97.
- Trudgett, M., Page, S., Bodkin-Andrews, G., Franklin, C., & Whittaker, A. (2017). Another brick in the wall? Parent perceptions of school educational experiences of Indigenous Australian children. In M. Walter, K. L. Martin, & G. Bodkin-Andrews (Eds.), *Indigenous children growing up strong: A longitudinal study of Aboriginal and Torres Strait Islander families* (pp. 233–258). London: Palgrave Macmillan.
- Walter, M. (2015). The vexed link between social capital and social mobility for Aboriginal and Torres Strait Islander people. *Australian Journal of Social Issues*, 50, 69–88.
- Walter, M. (2017). Doing Indigenous family. In M. Walter, K. L. Martin, & G. Bodkin-Andrews (Eds.), *Indigenous children growing up strong: A longitudinal study of Aboriginal and Torres Strait Islander families* (pp. 123–152). London: Palgrave Macmillan.
- Wild, R., & Anderson, P. (2007). *Ampe akelyernemane meke mekarle "little children are sacred": Report of the Northern Territory board of inquiry into the protection of Aboriginal children from sexual abuse*. Northern Territory Government.
- Wilson, B. (2013). *A share in the future: Review of Indigenous education in the Northern Territory*. Northern Territory Government.
- Yap, M., & Biddle, N. (2010). Gender gaps in Indigenous socioeconomic outcomes: Australian regional comparisons and international possibilities. *The International Indigenous Policy Journal*, 1, Art. 3.
- Yu, P., Duncan, M. E., & Gray, B. (2008). *Northern Territory Emergency Response: Report of the review board*. Commonwealth of Australia.
- Ziliak, J. P. (2015). Temporary assistance for needy families. In R. A. Moffitt (Ed.), *Economics of means-tested transfer programs* (Vol. 1, pp. 303–396). Chicago: University of Chicago Press.

# Appendix A

**Table A1: The Effect of Income Management on School Attendance Non-Movers Only: OLS Regression Results**

	(1)	(2)	(3)
<i>Panel A: Single treatment identifier</i>			
<b>Treatment</b>	<b>-0.017**</b> (0.006)	<b>-0.010**</b> (0.005)	<b>-0.008*</b> (0.005)
<i>Panel B: Treatment effect by time since income management commenced</i>			
<30 days ago	-0.008 (0.006)	<b>-0.016**</b> (0.006)	<b>-0.015**</b> (0.006)
30-59 days ago	-0.014* (0.008)	<b>-0.021**</b> (0.006)	<b>-0.017**</b> (0.006)
60-89 days ago	<b>-0.030***</b> (0.008)	<b>-0.033***</b> (0.007)	<b>-0.029***</b> (0.007)
90-119 days ago	<b>-0.027**</b> (0.009)	<b>-0.021**</b> (0.007)	<b>-0.018**</b> (0.007)
120-149 days ago	<b>-0.023**</b> (0.009)	<b>-0.009</b> (0.007)	<b>-0.006</b> (0.007)
150+ days ago	-0.002 (0.010)	0.005 (0.006)	0.004 (0.006)
<b>School FE</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
<b>Time FE</b>	<b>Y</b>		
<b>Time trend</b>		<b>Y</b>	<b>Y</b>
<b>School-Term FE</b>		<b>Y</b>	<b>Y</b>
<b>School×Term</b>		<b>Y</b>	<b>Y</b>
<b>School×Time trend</b>			<b>Y</b>
<b>Time trend×Term</b>			<b>Y</b>
<b>School×Term×Time trend</b>			<b>Y</b>
<b>Grade FE</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
<b>Day of the week FE</b>	<b>Y</b>	<b>Y</b>	<b>Y</b>
<b>N</b>	<b>1446422</b>	<b>1446422</b>	<b>1446422</b>
<b>R<sup>2</sup></b>	<b>0.104</b>	<b>0.105</b>	<b>0.114</b>

Notes: Cluster robust (student level) standard errors reported in parenthesis. The dependent variable is an indicator for if the student attended school for the whole day at time  $t$ . The estimation sample is an unbalanced panel of all students in grades 1-12 enrolled in the NT public education system during the period 2006-2009 (inclusive) that excludes those students who moved community during this period. Movers are those students who are either i) enrolled in two or more different schools in different communities during the period (as identified in the NT Department of Education school enrollment records) or ii) who join/leave the estimation sample during the period, except for those students entering in grade 1 or exiting in grades 11 or 12. Students are counted as having left if they exit the dataset for at least six months. Students are counted as having joined if they first enter the dataset or return to the dataset after an absence of at least six months. The full set of available controls include school fixed effects, time fixed effects (day level), a linear time trend, grade fixed effects (grades 1-12), day of the week fixed effects (Monday-Friday) and school-term fixed effects. There are four school terms per year; in 2007 the school terms were as follows: term 1 - 29 January-5 April; term 2 - 16 April-22 June; term 3 - 23 July-28 September; and term 4 - 8 October-14 December. These dates are similar for other years. Estimates are obtained by OLS. \*,\*\* and \*\*\* is statistical significance at the 10%, 5% and 1% level respectively.

Table 2: Overview of Main Policies Introduced Under the NTER

<i>Welfare reform and employment</i>	
Income management	Involved quarantining 50 percent of most welfare payments. Transfer payments subject to income management were: Newstart allowance; Disability support pension; Parenting payments (partnered/single); Carer allowance; Carer payment; Youth allowance, Age pension; ABSTUDY; Family tax benefits Part A and B. Income management applied to all recipients of these benefits unless they obtained an exemption. Exemptions could be given to: i) students living away from home or whose payments are received by a third party; ii) temporary residents to a community; iii) persons who moved indefinitely away from a community; iv) persons in the community to assist with the NTER; v) persons with little connection to the community. One-off payments (including the Baby Bonus) were subject to 100 percent income quarantining. Quarantined income could not be spent on alcohol, tobacco, pornography or gambling.
Store licence	The licensing of community stores was a precondition for the introduction of income management to ensure that participants had at least one local option for buying necessities with their managed funds. To obtain a licence stores needed to demonstrate sound financial practices with regards to stock and pricing. Centrelink clients could organize to access their income management funds at licensed stores, with the store-operator responsible for ensuring the income was not spent on prohibited items.
Remote area exemptions (RAEs) lifted	RAEs refer to exemptions given to job seekers on the required obligations in order to receive welfare support. This measure aligned the requirements for urban and rural job seekers.
Community Development Employment Projects (CDEP) transition	CDEP is a Government program whereby community members agree to pool unemployment benefits and have them paid as a type of wage in exchange for participation in various local community initiatives. Under the NTER, CDEP was to be phased out. However, the decision was overturned in April 2008 and CDEP was reinstated.
Community Employment Brokers (CEBs)	CEBs were employed to coordinate employment services under the NTER until mid-2009.
<i>Education and child health</i>	
Child health checks	Child health checks involved clinicians visiting areas covered by the NTER and conducting voluntary health assessments of children aged 15 years and under. Under the measure between 57-65 percent of eligible children were seen by a physician (Matheson & Hardie-Boys, 2011).
School nutrition	Under this measure, schools provide breakfast and lunch to students, paid for by parents.
Accelerated literacy	A teaching program for enhancing literacy skills across all ages.
Quality teacher package (QTP)	The QTP is a professional development framework focused on improving the skills of local Indigenous staff in communities.
<i>Law and Order</i>	
Banning alcohol	Serious penalties associated with possession, use and supply of alcohol in affected communities.
Banning pornography	Made it an offence to possess or supply pornographic publications, videos or refused classification material.
Night patrols	Night patrols are community led services that aim to resolve issues of conflict and crime in a culturally appropriate way. The exact operation and role of night patrols is fluid and differs across communities.
Extra police	Additional police officers were placed in some communities.
THEMIS police station	Operation THEMIS involved the construction new police stations in 18 communities.
<i>Family support</i>	

Safe house	Additional safe houses were constructed or expanded. Safe houses provide sanctuary to people escaping family violence. Funding was also allocated to cooling off houses, which are used by people to avoid committing family violence.
Remote Aboriginal family and community workers (RAFCWs)	These workers provide support and community education in the area of child protection. RAFCWs were placed in 13 communities and provided outreach services to a further 20 communities (FAHCSIA, 2011).
Child special services	Under this measure an Aboriginal Mobile Outreach Service was established, which involved teams of counsellors and social workers who provided support to children, adolescents and families in matters of sexual assault.

***Housing and Land***

Leases	Compulsory five-year leases were used by the Australian Government as a legal basis for undertaking infrastructure and community service projects on Aboriginal land.
All Community Clean Up (CCU) works completed	Funding was provided for several measures to improve the safety and condition of existing buildings. These included property assessments, minor vital repairs, make safe works and an asbestos survey.

***Governance***

Government Business Managers (GBMs)	GBMs were employees of the Department of Families, Housing, Community Services and Indigenous Affairs (Australian Government) who were allocated to NTER communities and tasked with coordinating all Government services for that community.
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