The Effect of Restricting Welfare on School Attendance and Birth Weights in Indigenous Communities

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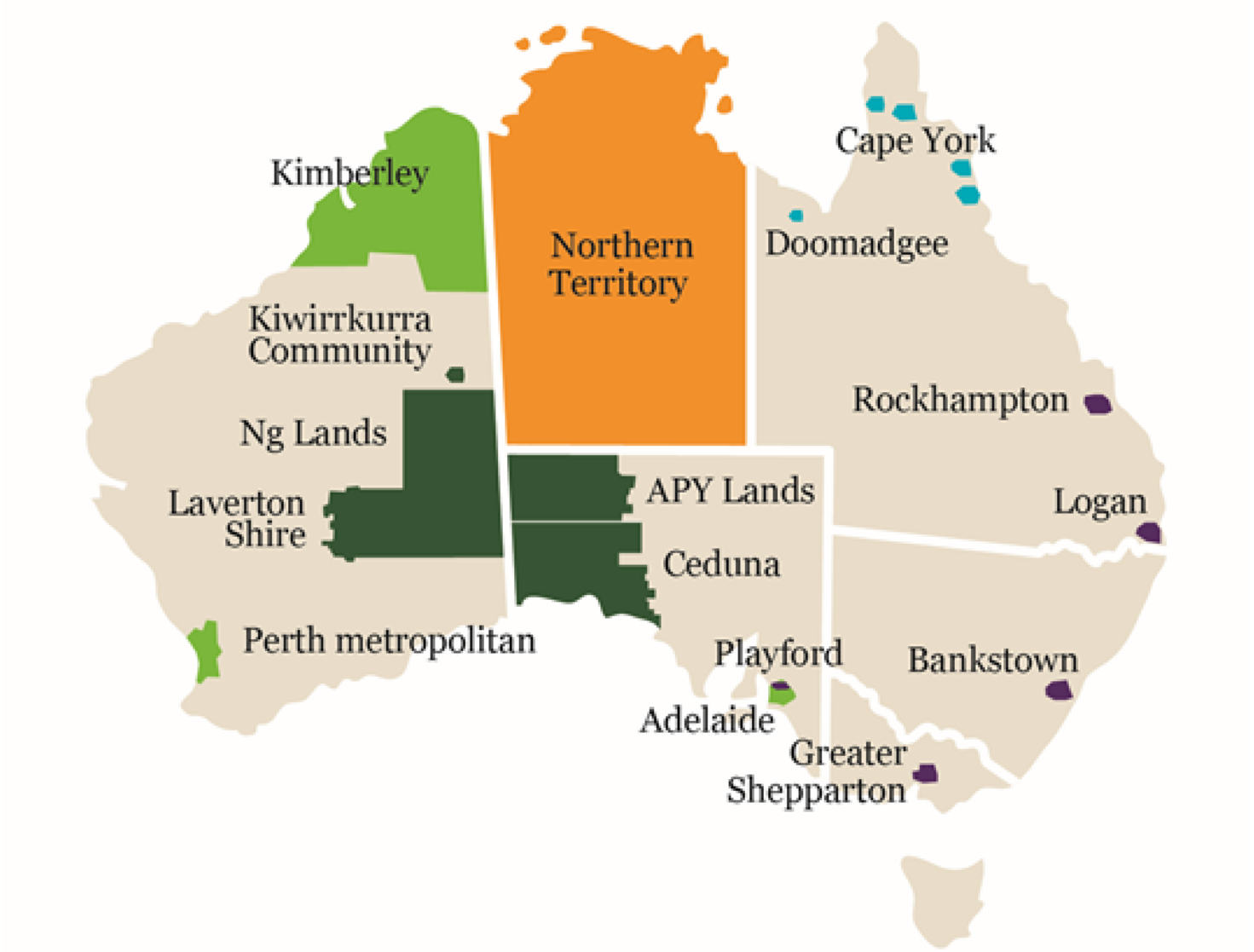
THE UNIVERSITY OF SYDNEY

Income management locations today



Source: Department of Social Services, www.dss.gov.au. Accessed 18 October 2017.

Background IM in 2007 – part of the NTER

Aim: The Australian Government radically changed the way welfare payments were delivered to **address the behavioral causes of social disadvantage** in Indigenous communities.

Objectives

1. "To stem the flow of cash going towards substance abuse and gambling and ensure that funds meant to be for **children's welfare** are used for that purpose" (Brough 2007).
2. "To promote socially responsible behaviour, particularly in relation to **the care and education of children**" (Social Security and Other Legislation Amendment (Welfare Payment Reform Act 2007 No. 130, 2007 123TB Objects, Section (a)).

Previous Evidence

The evidence base for the 2007-2008 IM is weak

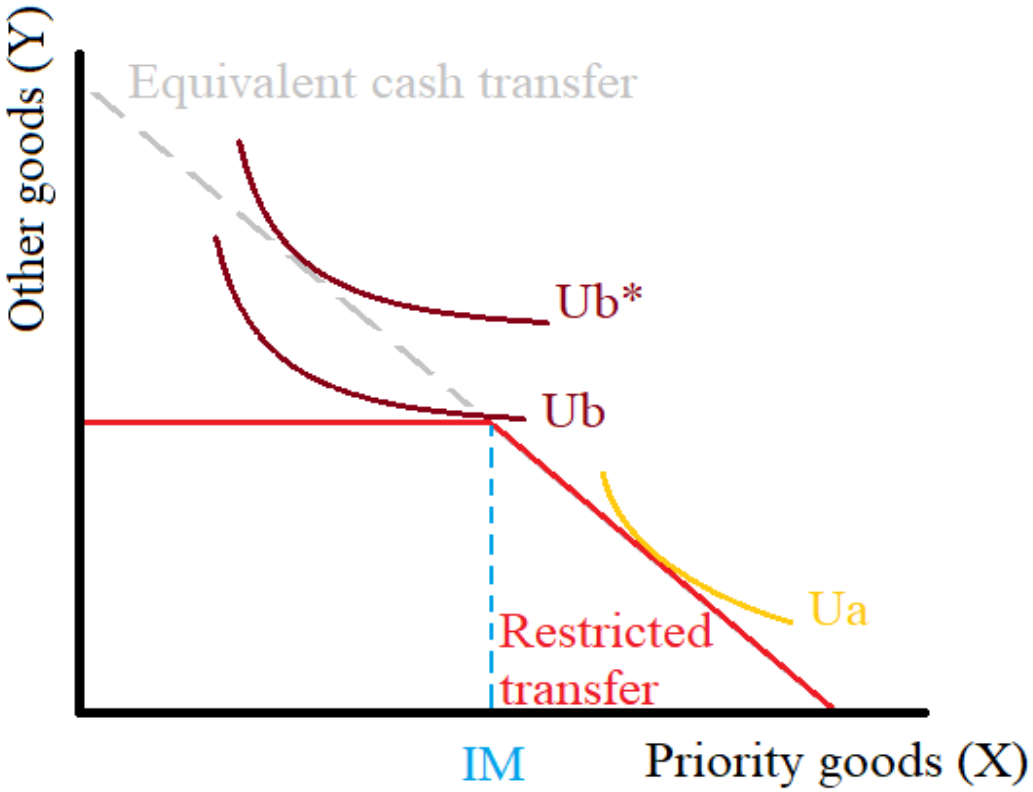
- For NTER income management: mixed support for the policy and whether it achieved its objectives (e.g. Australian Institute of Health & Welfare, 2010; Central Land Council, 2008).
- Issues with its implementation: lack of consultation, uncertainty from rapid program changes, frustration with the loss in empowerment, embarrassment and stigmatisation (Yu et al, 2008).
- Quantitative evaluations: Brimblecombe et al (2010) on consumption patterns (no effect); Lamb & Young (2011) on poker machines (limited effect).

Projects I will talk about today

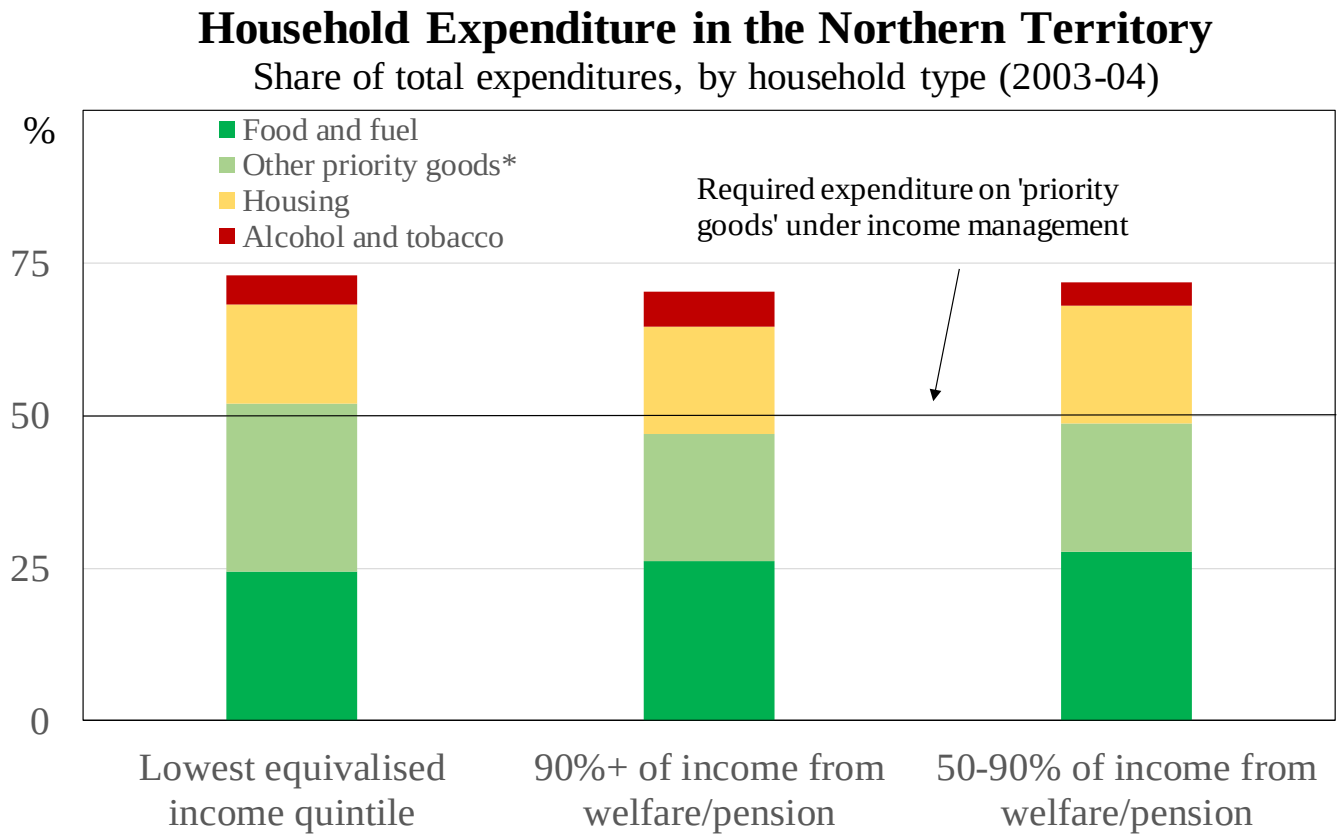
POLICY EVALUATION OF IM AS PART OF NTER 2007-2008

1. Cobb-Clark, Kettlewell, Schurer, and Silburn (2017). *The Effect of Quarantining Welfare on School attendance in Indigenous communities*. Life Course Centre Working Paper Nr 2017-22
2. Doyle, Schurer, and Silburn (2017). *Do welfare restrictions improve child health? Estimating the impact of income management in the Northern Territory*. Life Course Centre Working Paper Nr 2017-21
3. Descriptive analysis using Longitudinal Study of Indigenous Children (LSIC) to be prepared for a Conversation article.

Does the policy have any impact?



Consumptions patterns in Northern Territory pre-IM



* Includes: clothing and footwear; household furnishings and equipment, medical care and health expenses; transport.
Source: ABS Household Expenditure Survey

Outcomes

- School attendance ✓
- Birth weight, probability of low birth weight ✓
- Crime X but possible (admin data)
- Domestic violence
- Consumption ✓ X (LSIC)
- Humbugging ✓ X (LSIC)

Northern Territory Data Linkage Project (Menzies SHR)

Improving the Developmental Outcomes of NT Children: A Data Linkage Study to Inform Policy and Practice across the Health, Education and Family Services Sectors".

- Funding is through a Partnership Project (2014-2017) between the National Health and Medical Research Council (NHMRC) and the NT Government.

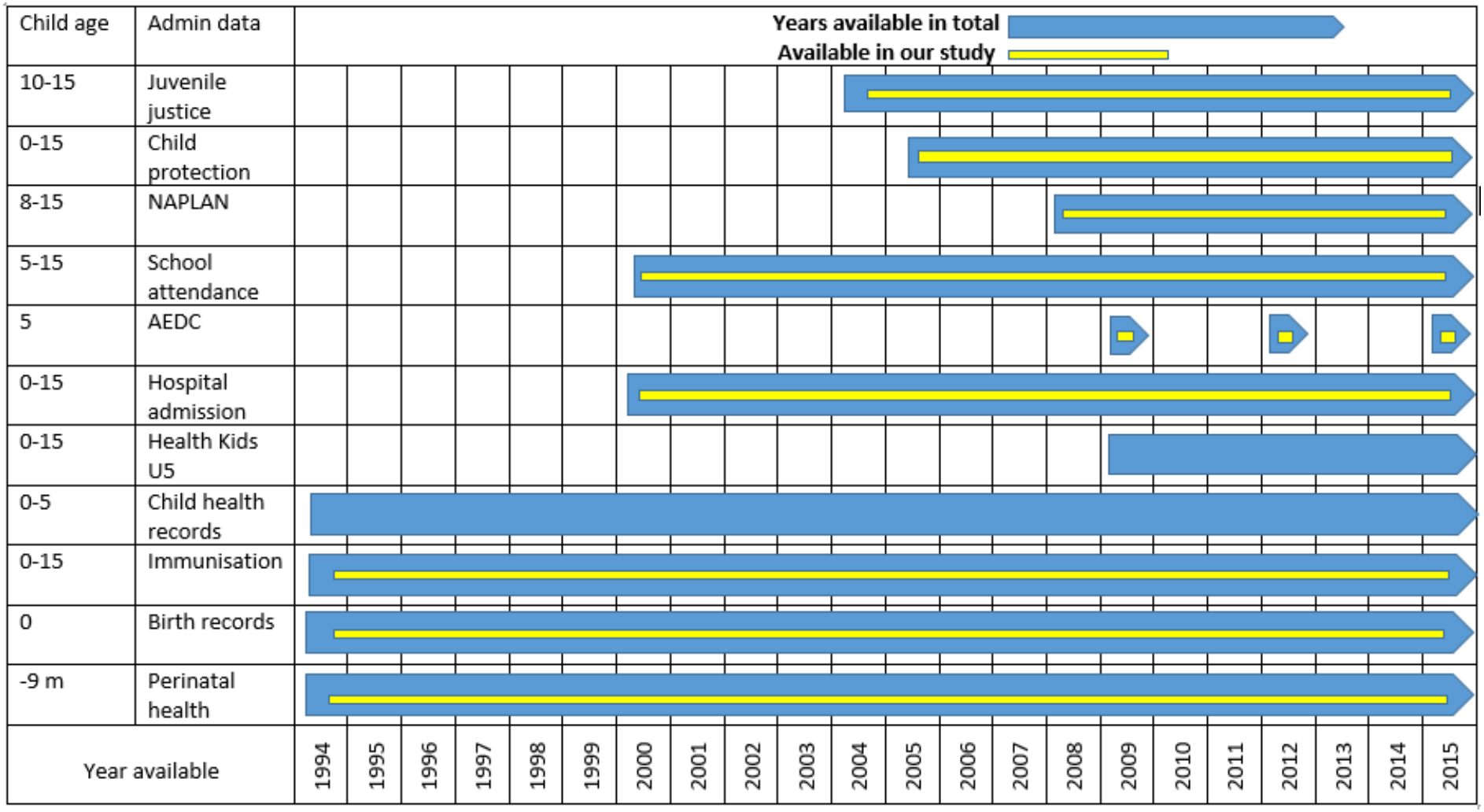
Ethics:

- We follow **NHMRC Values and Ethics: Guidelines for Ethical Conduct in Aboriginal and Torres Strait Islander Health Research (2003)** and the **Australian Institute of Aboriginal and Torres Strait Islander Studies (AIATSIS) Guidelines for Ethical Research in Australian Indigenous Studies (2012)**

Reciprocity, Respect, Equality, Responsibility,
Survival and Protection, Spirit and Integrity

- Ethics agreement HREC Reference Number: 2016-2611 Project Title: Improving the developmental outcomes of Northern Territory children: A data linkage study to inform policy and practice in health, family services and education (Human Research Ethics Committee of the Northern Territory Department of Health and Menzies School of Health Research)

NT Data Linkage Project



Child age	Admin data	Year available
10-15	Juvenile justice	
0-15	Child protection	
8-15	NAPLAN	
5-15	School attendance	
5	AEDC	
0-15	Hospital admission	
0-15	Health Kids U5	
0-5	Child health records	
0-15	Immunisation	
0	Birth records	
-9 m	Perinatal health	

1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

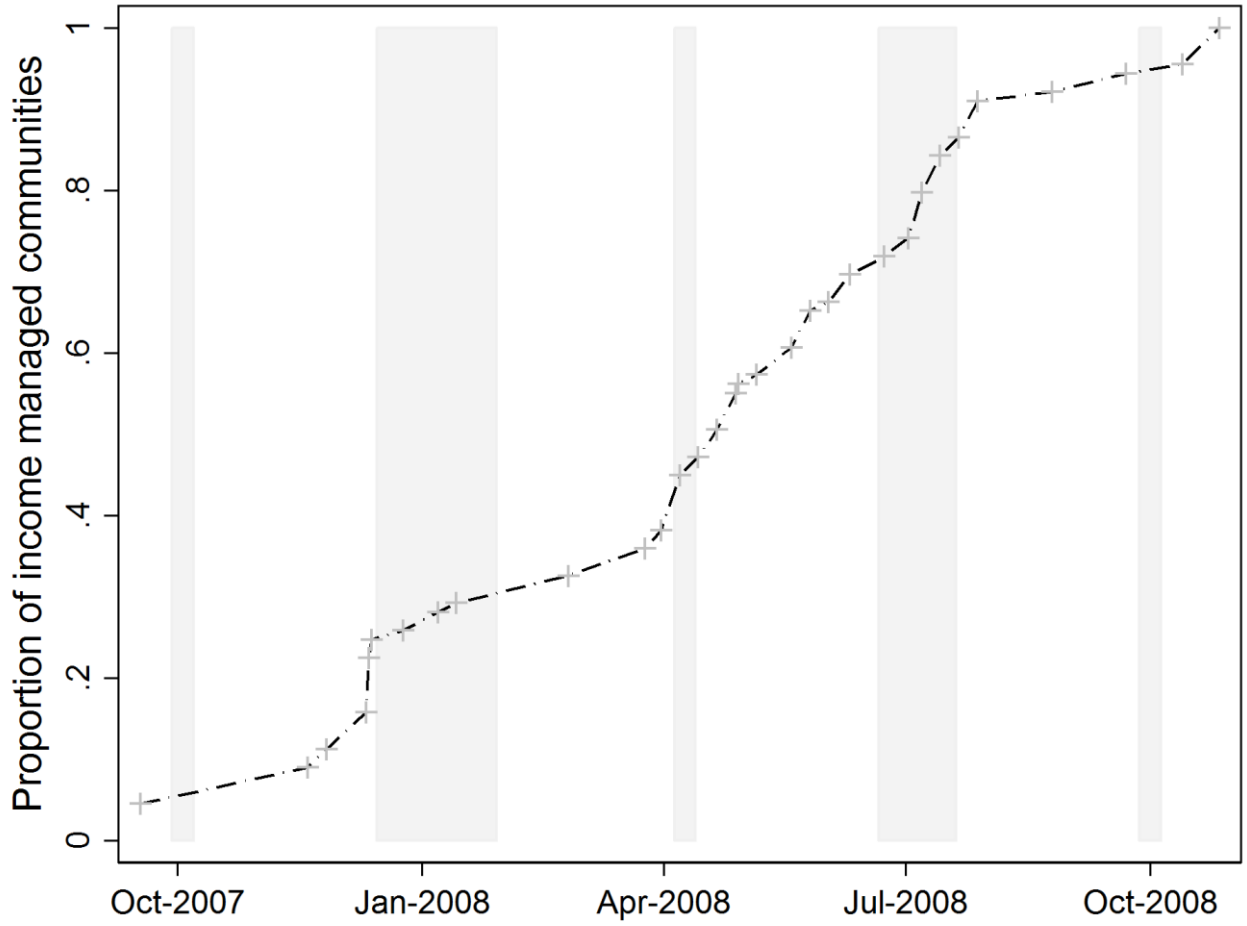
The Operation of Income Management

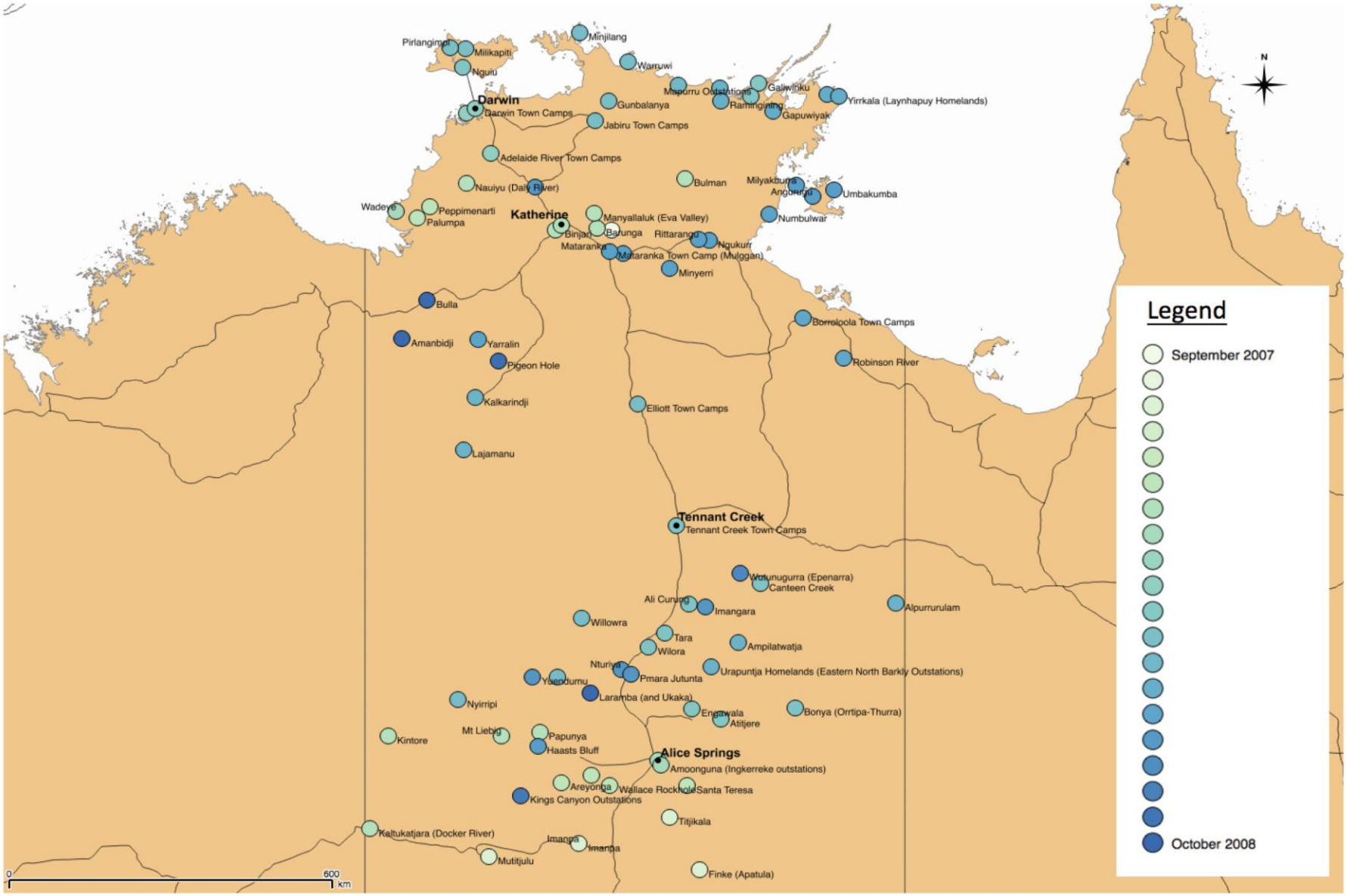
- Community-based; compulsory to 73 prescribed communities;
- Quarantined: 50% of most welfare payments; 100% of lump sums (e.g. baby bonus). DETAILS
- Exemptions: rare (3%);
- Quarantined income was stored in an income management account, three access methods
- Welfare recipient was required to meet with Centrelink rep to allocate funds – if not: auto-income managed;
- Basics Card: **8 Sep 2008** significantly improved access to welfare benefits (AIHW, 2010).

- **Roll out happened in stages → Natural experiment**

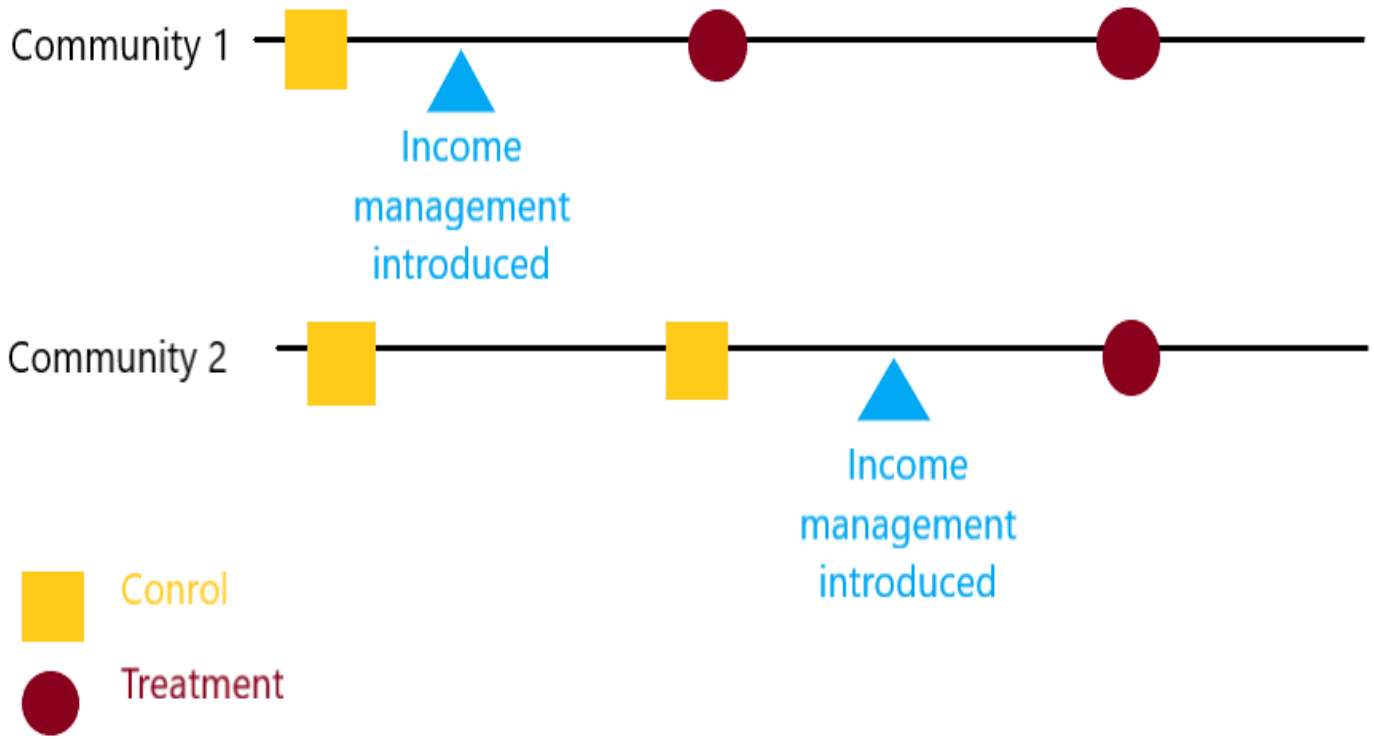
Food Stamps/SNAP(e.g. Hoynes & Schanzenbach 2009, Almond, Hoynes, and Schanzenbach 2011)

Roll Out of Income Management




Minjilang
Pirlangimpi
Milikapiti
Nguiu
Warruwi
Maputiu Outstations
Galiwinku
Yirrkala (Laynhapuy Homelands)
Darwin
Darwin Town Camps
Gunbalanya
Ramingining
Gapuwiyak
Jabiru Town Camps
Adelaide River Town Camps
Nauiyu (Daly River)
Bulman
Milyakburra
Angurugu
Umbakumba
Wadeye
Peppimenarti
Palumpa
Katherine
Manyallaluk (Eva Valley)
Numbulwar
Binjari
Barunga
Rittarangu
Ngukurr
Mataranka
Mataranka Town Camp (Mulggan)
Minyerri
Bulla
Borroloola Town Camps
Amanbidji
Yarralin
Pigeon Hole
Robinson River
Kalkarindji
Elliott Town Camps
Lajamanu
Tennant Creek
Tennant Creek Town Camps
Wutunugurra (Epenarra)
Canteen Creek
Ali Curung
Imangara
Alpurrurulam
Willowra
Tara
Wilora
Ampilatwatja
Nturiya
Pmara Jutunta
Urapuntja Homelands (Eastern North Barkly Outstations)
Yuendumu
Laramba (and Ukaka)
Nyirripi
Engawala
Bonya (Orrtipa-Thurra)
Atitjere
Mt Liebig
Papunya
Kintore
Haasts Bluff
Alice Springs
Amoonguna (Ingkerreke outstations)
Areyonga
Wallace Rockhole
Santa Teresa
Kings Canyon Outstations
Titjikala
Kaltukatjara (Docker River)
Imanpa
Mutitjulu
Finke (Apatula)
0
600
km
N
Legend
September 2007
October 2008

Identification strategy



Income management and school attendance

Sample

- Sample: restricted to the period 2006-2009 (inclusive)
  - This covers approximately ±1.5 years from the rollout start/end.
- Rollout schedule obtained from AIHW (2010)
  - Link schools in our sample to community start dates.
- Match 130 schools to 78 separate communities:
  - 61 communities have a single school only.
  - 47 schools are so called `homeland learning centres' (<3% of obs.).
- Sample: students enrolled in grades 1-12.
  - Transitional year (K) is non-compulsory in Northern Territory. Primary is 1-6, middle 7-9 and senior 10-12. Can drop out after age 17.
- Observation unit: student-day.
  - We end up with an unbalanced panel of 9,162 students and ≈ 3.5m student-day observations.
  - Low attendance - average attendance 62%.
  - High mobility - around 40% of students move each year.

Identification

We require that the rollout of income management is unrelated to temporal changes in school attendance patterns.

- Other NTER initiatives?
- No clear spatial pattern to the rollout (see Figure 2)
- Rollout is largely unrelated to pre-existing community characteristics; $R^2 < .1$ (see Table 1)
- Event-study analysis: EventStudy
  - No systematic trends preceding income management
  - Policy effect occurs precisely around program start date
- No evidence of a "pseudo policy effect" (2005-2007 data)

We have strong evidence that our identification assumption holds.

NTER Rollout

BACK

Measure	Jul-Sep 2007	Oct-Dec 2007	Jan-Mar 2008	Apr-Jul 2008
Welfare reform and employment				
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)
Education and child health				
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)
Law and order				
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)

Community Characteristics

	Australian Population	Sample Mean	Sample Min	Sample Max
Population size		428	83	1904
Percent male	49.4%	48.6%	40.9%	56.5%
Median age (years)	37	22.1	18	27
English only language spoken at home	78.5%	17.23%	0%	94.4%
Labour force part. rate	64.6%	37.8%	6.90%	83.5%
Employment rate	94.8%	86%	9.2%	100%
Median Personal Income	$466	$209.82	$148	$466
Average people per household	2.6	6.08	3.3	9.6

Note: 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.

Identification

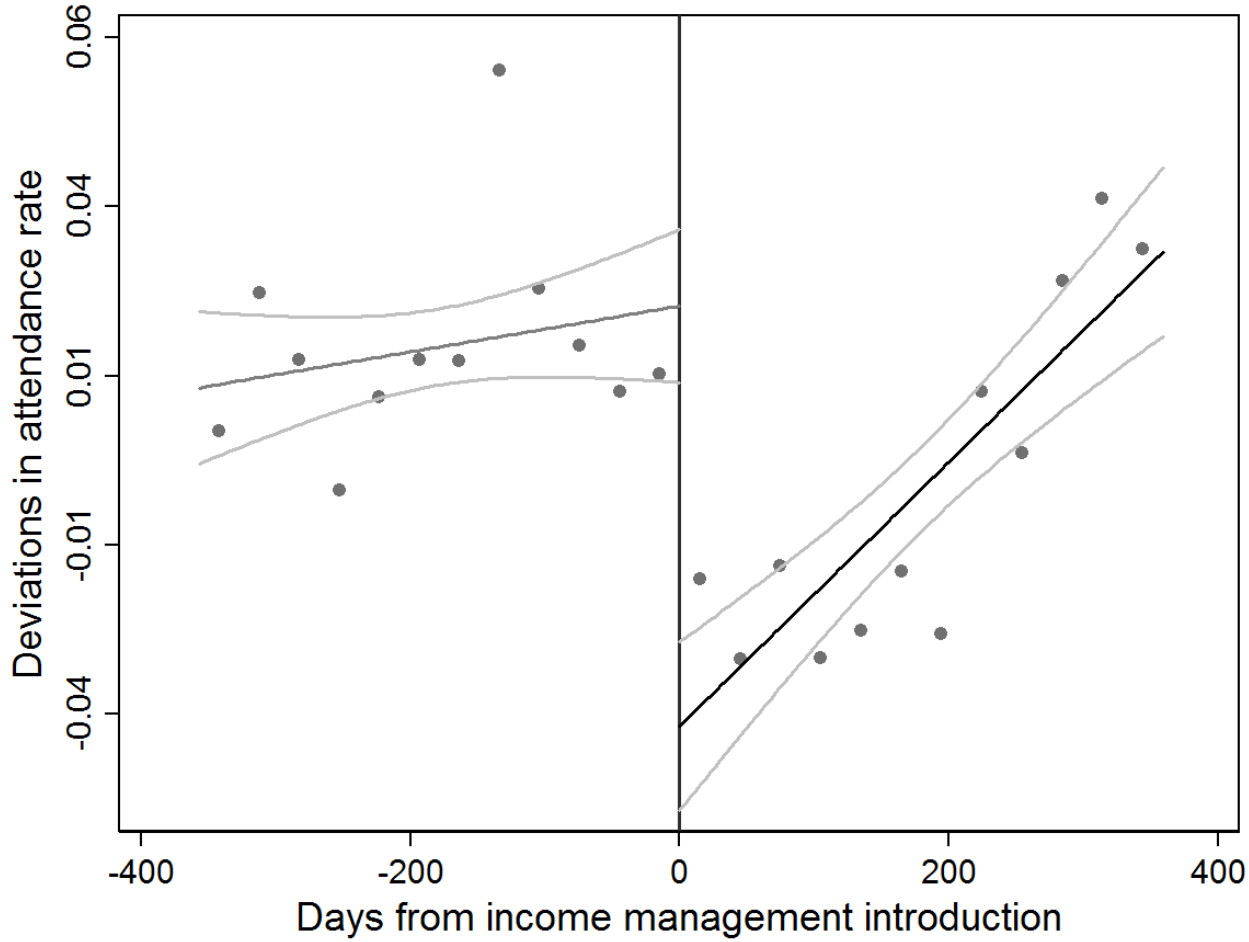
BACK

Table 1: Community Characteristics and the Timing of Income Management

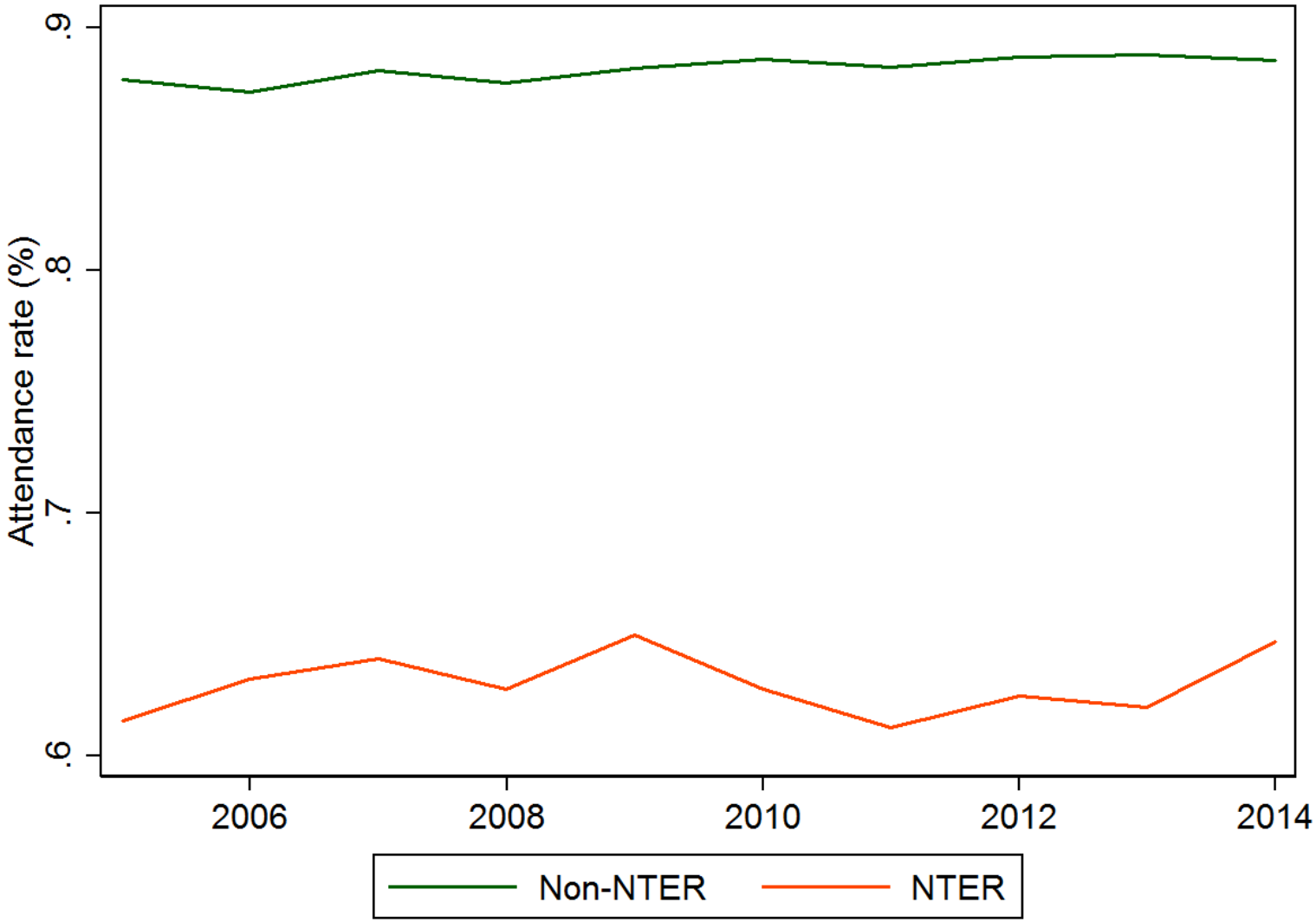
Dep. Var. = start day	Model 1	Model 2
Population/100	-0803 (14.418)	2.508 (14.450)
(Population/100)^2	-0.287 (0.681)	-0.349 (0.679)
% male	2.996 (5.541)	0.372 (5.194)
Median age	7.159 (8.126)	8.040 (8.028)
% English only language	0.811 (0.615)	0.861 (0.587)
Labour force partic. rate	-0.150 (1.005)	-0.045 (1.027)
Employment rate	0.228 (0.703)	0.230 (0.701)
Median personal income	0.168 (0.248)	0.166 (0.230)
Avg. people/per household	25.728* (13.636)	25.512* (13.813)
Demographics missing		366.269 (260.483)
N	55	64
R^2	0.090	0.077

Event Study Results

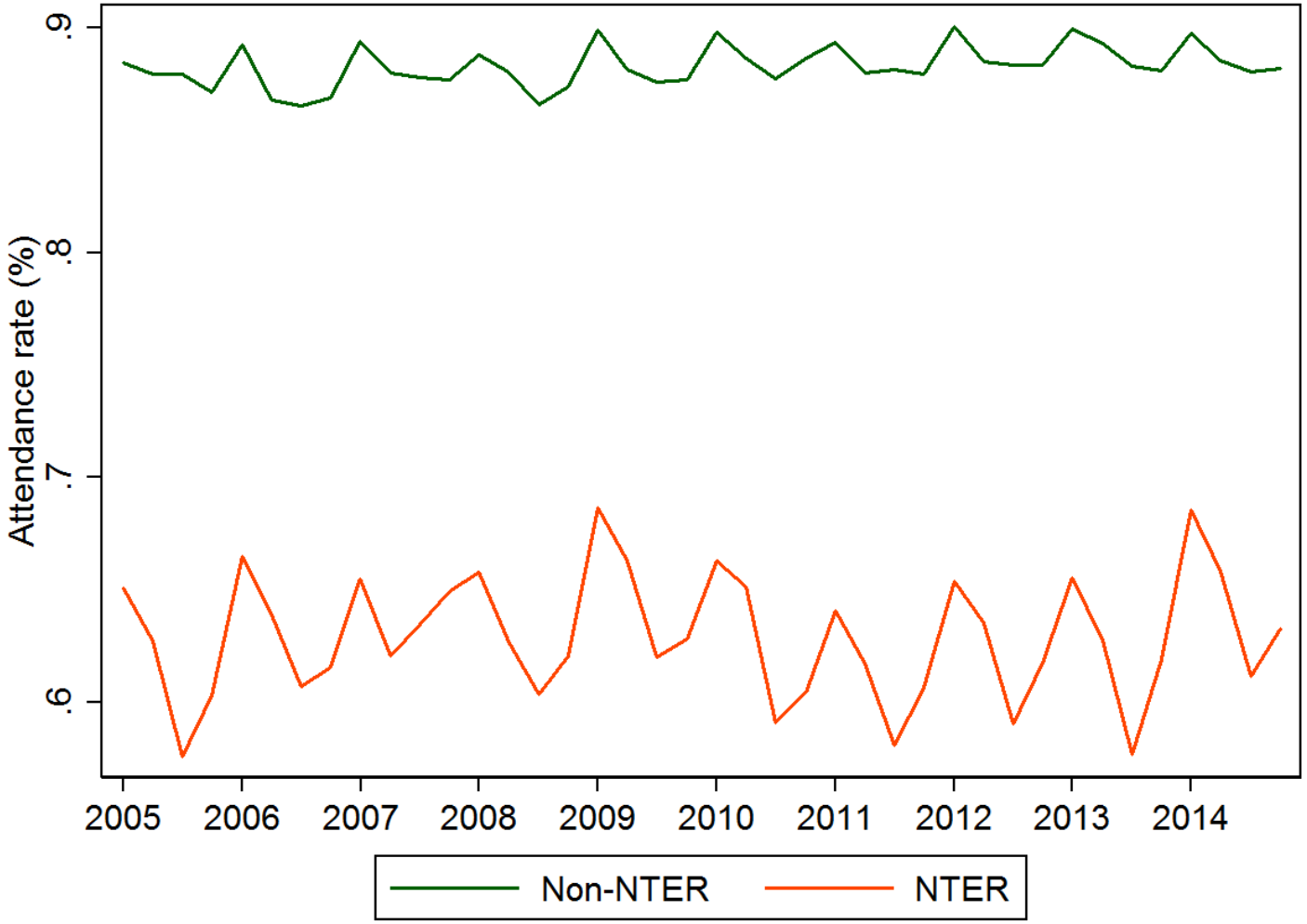
BACK



Modeling school attendance trends



Attendance trends – by term



Model

Baseline model: difference-in-differences estimator

$$Y_{isldt} = \alpha + \beta IM_{isldt} + \gamma_s + \tau_t + \lambda_l + \delta_d + \epsilon_{isldt} \quad (1)$$

$Y_{isldt} = 1$ if attended school for the whole day
$IM_{isldt} = 1$ if attending school in income-managed community

Controls:

School (s), time (t), grade level (l) and day of the week (d) fixed effects.

Extension to (1): School-specific linear time trends with school-specific school-term shifters

Results

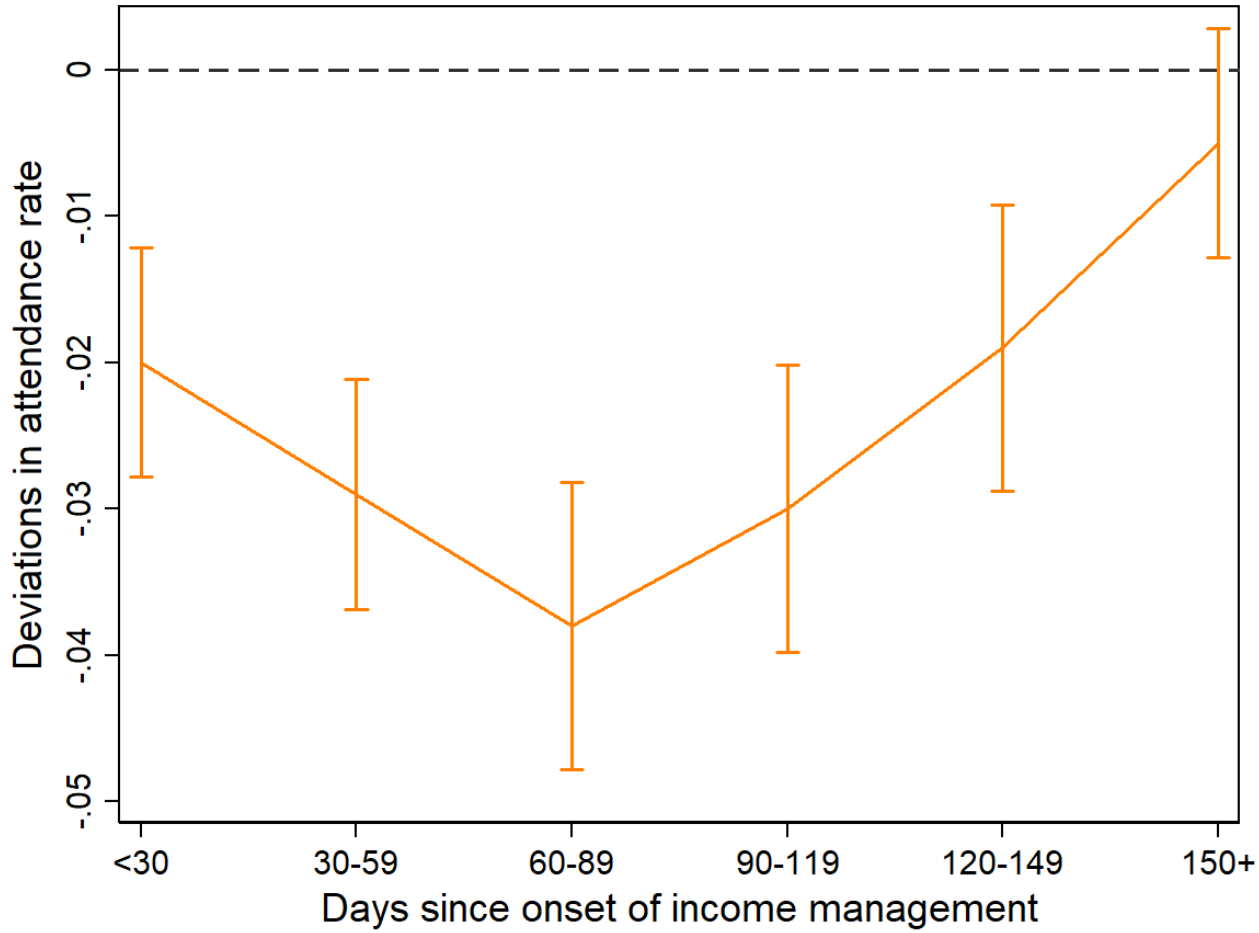
1. Aggregate (controls added subsequently)
2. Timing of reform
3. By sex
4. By school sector

Regression Results: D-i-D

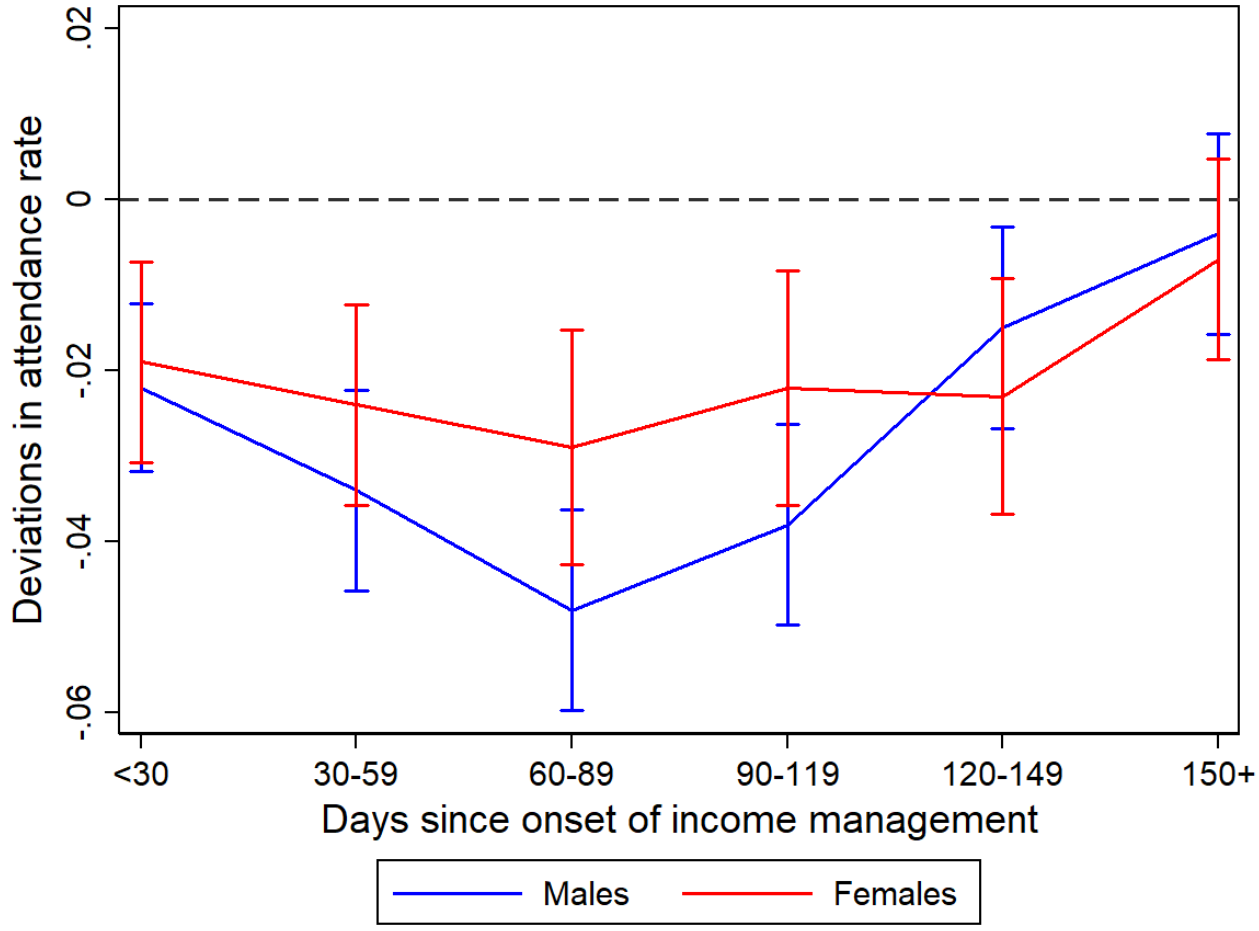
Table 4: Main Regression Results: Aggregate Treatment Effect

	(1)	(2)	(3)	(4)
Treatment	**-0.015*** (0.003)**	**-0.021*** (0.004)**	**-0.018*** (0.003)**	**-0.018*** (0.003)**
School FE		Y	Y	Y
Time FE		Y		
Time trend			Y	Y
School-term FE			Y	Y
School X Term			Y	Y
School X Trend				Y
Trend X Term				Y
School X Term X Trend				Y
Grade FE		Y	Y	Y
Day of week FE		Y	Y	Y

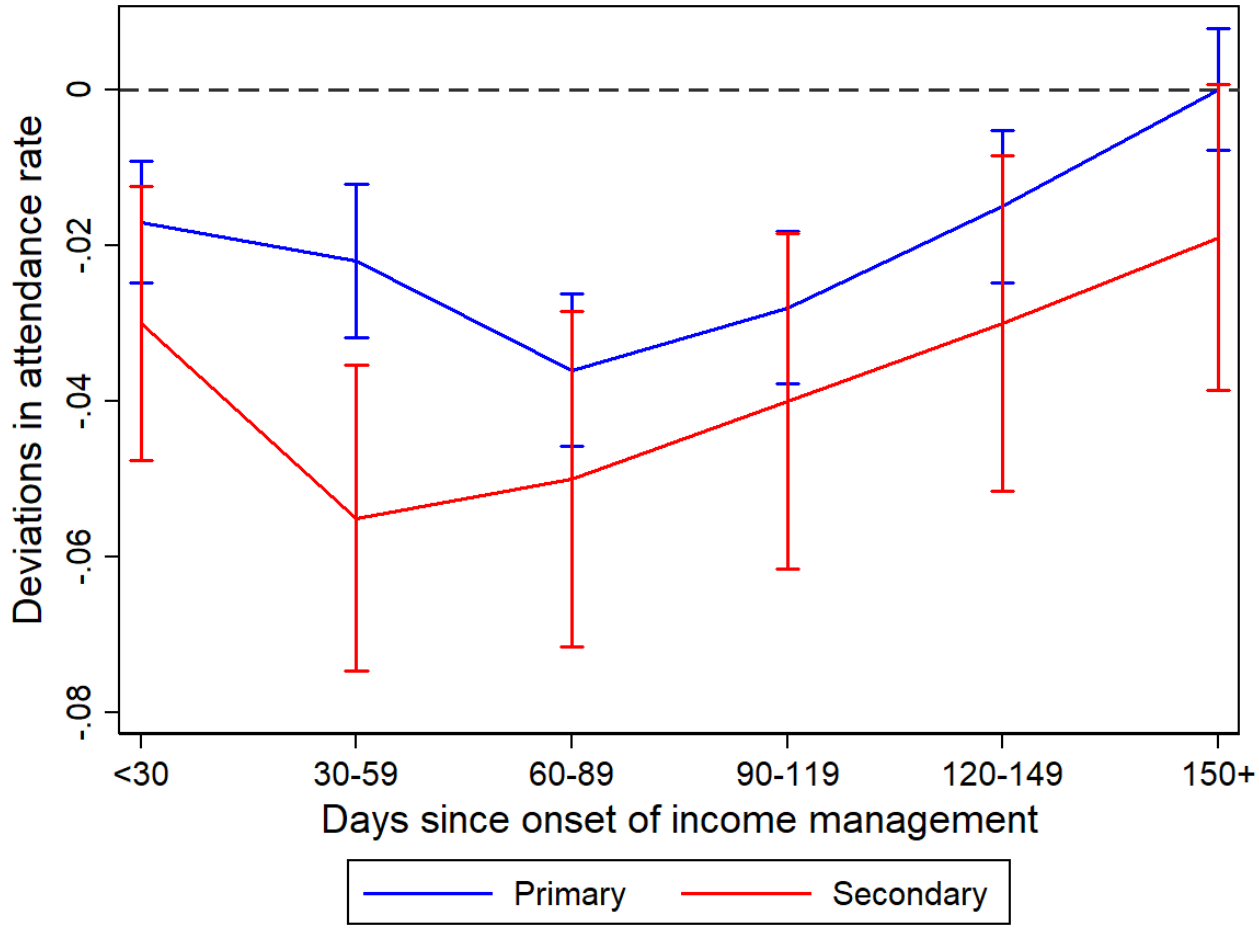
Treatment Effect by Days Since Onset



Treatment Effects by Sex



Treatment Effects by School Sector



Mechanisms

Why did income management lower attendance?

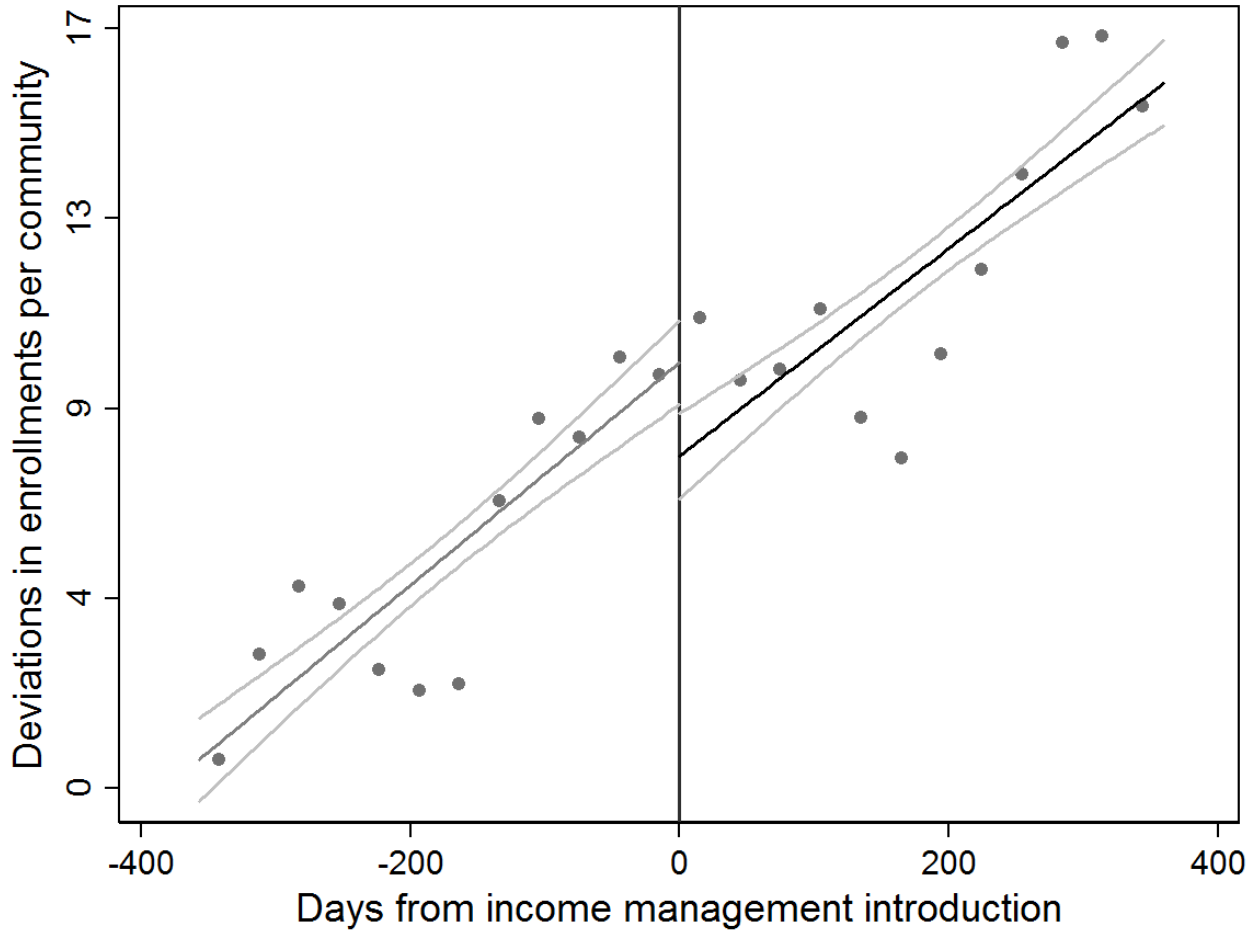
Four possibilities:

1. Confoundedness with the NTER.
2. Changes in school enrolment.
3. Changes in geographic mobility.
4. Implementation issues.

We find little evidence for 1-3 whereas there is evidence for 4.

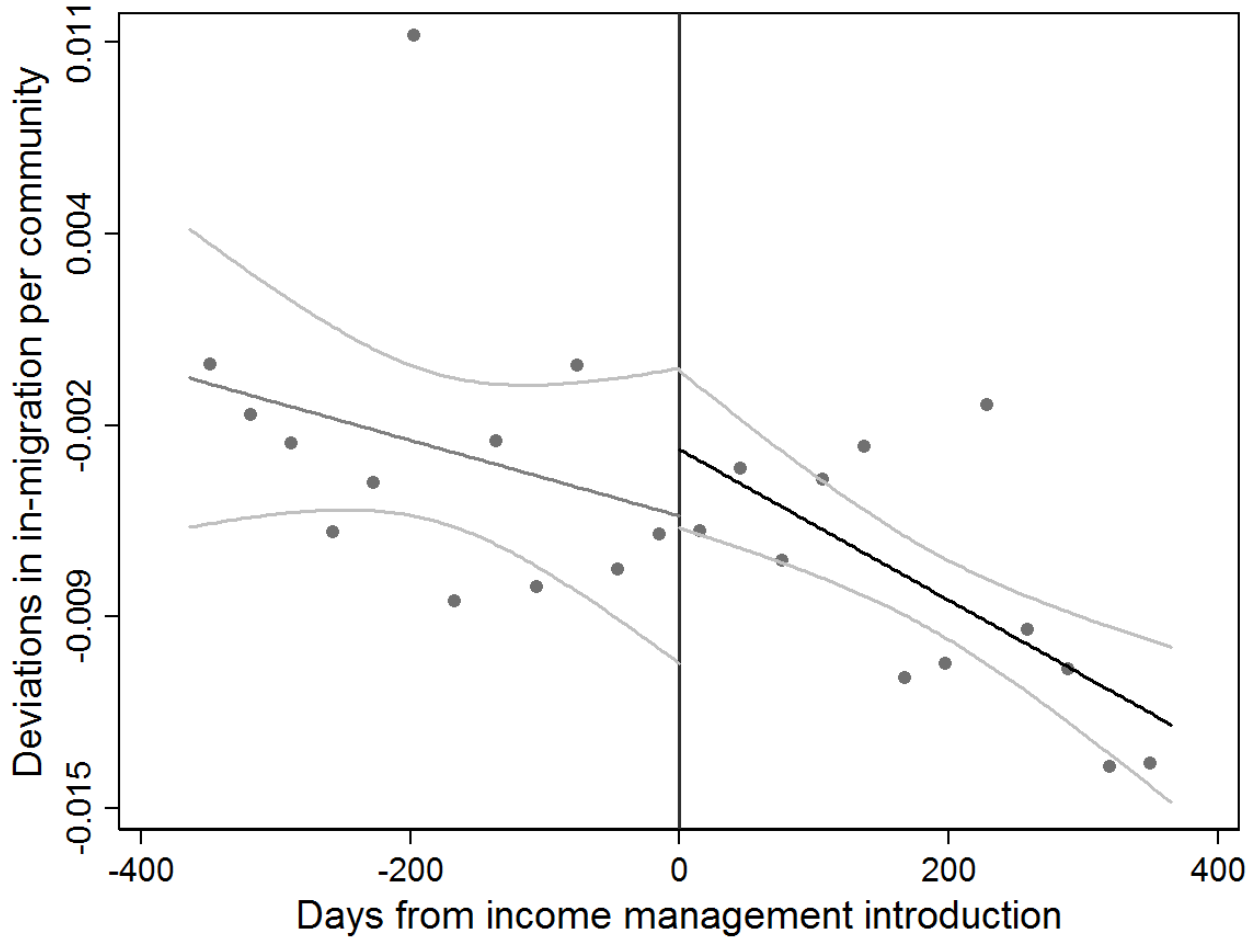
Enrollment

Figure 4: Dynamics in enrollments around the introduction of income management



Mobility: In-Migration

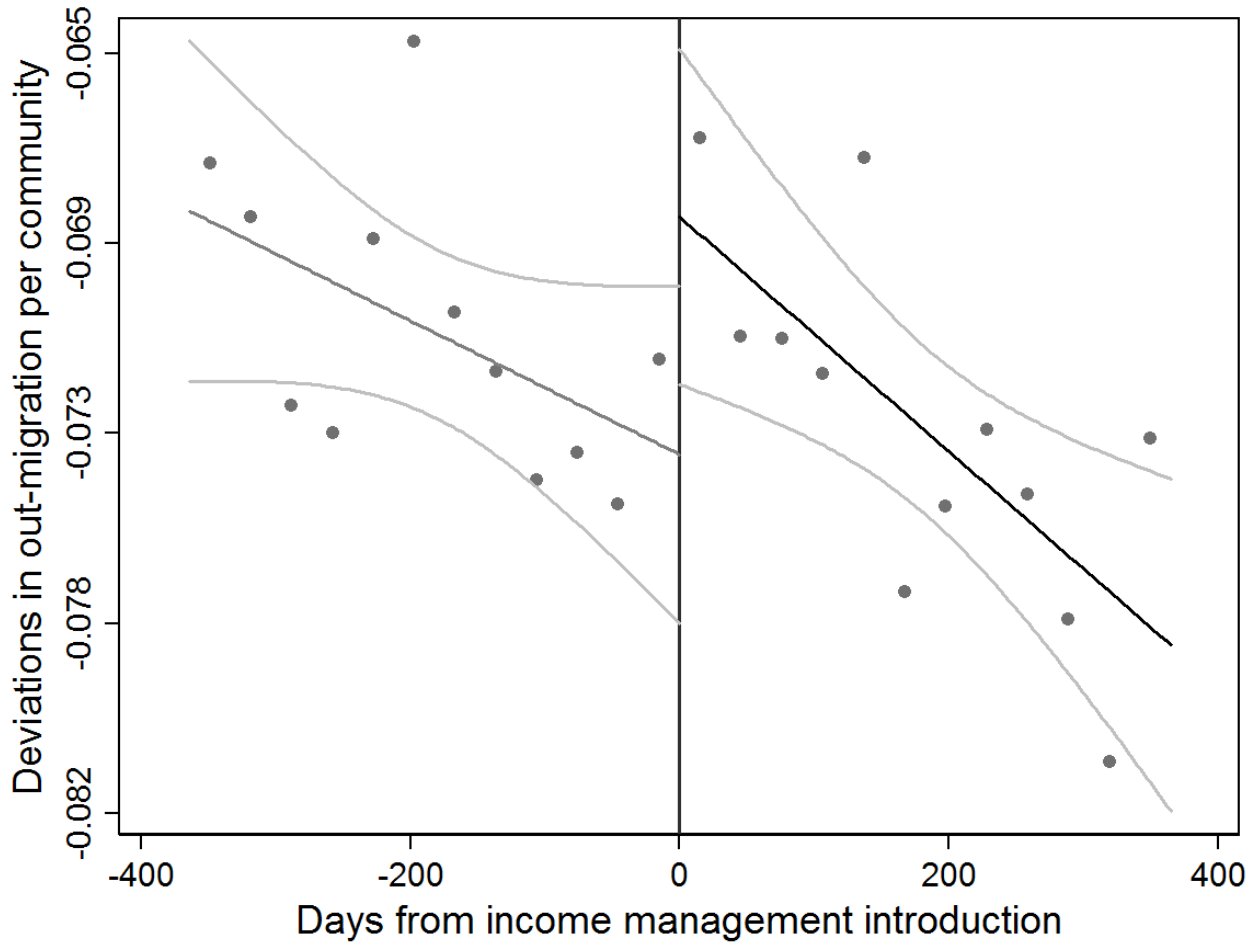
Figure 5: Student Mobility: In-Migration



Note: Comparison group: in-migration rate -365 days

Mobility: Out-Migration

Figure 6: Student Mobility: Out-Migration



Note: Comparison group: out-migration rate -365 days

4. Implementation issues

- Including a dummy for the Basics Card changes our estimate for 150+ days from **-0.005 to -0.019*** ** in our most flexible specification.
- The coefficient on the Basics Card dummy is **0.016*****.

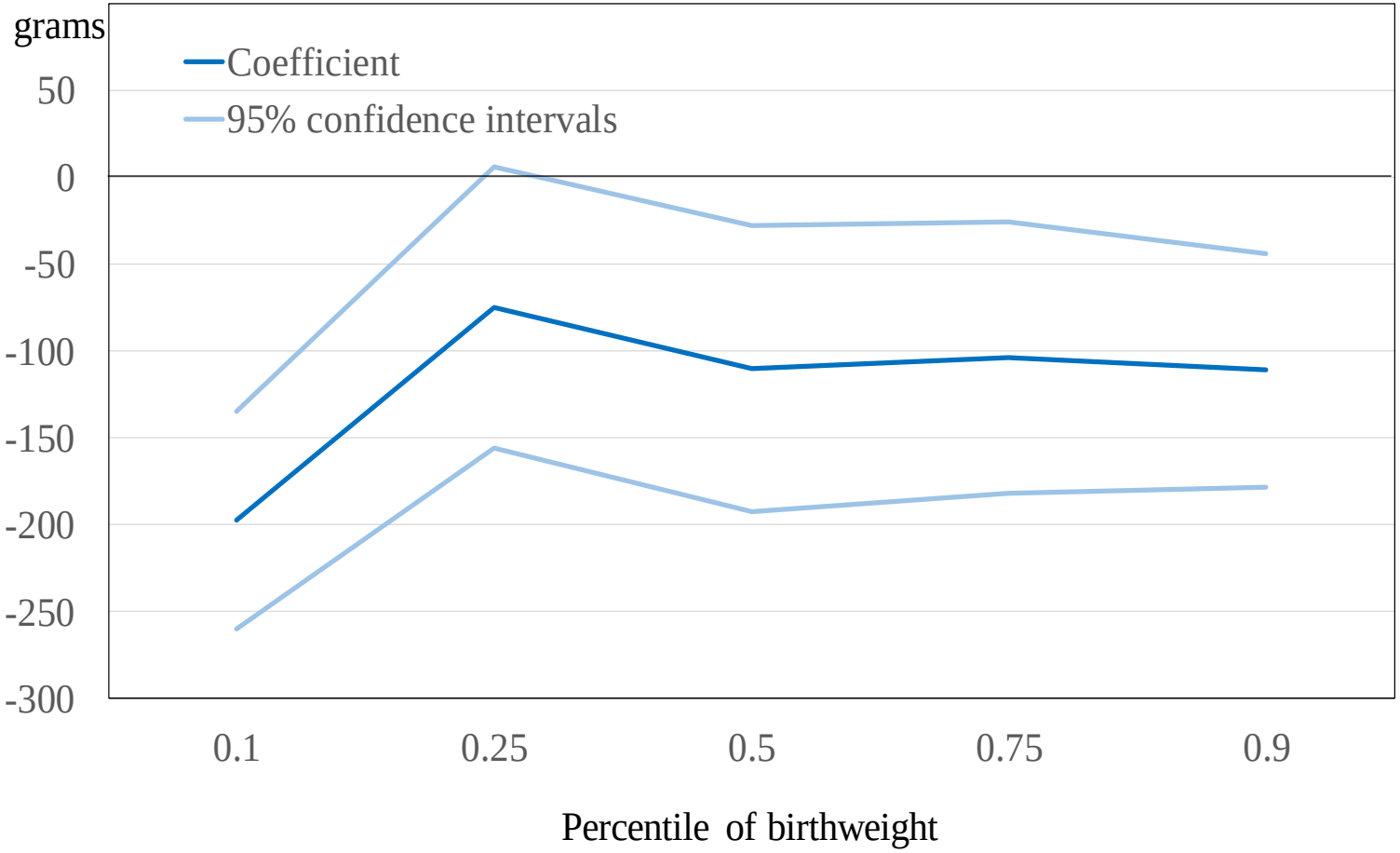
In the medium term, the positive effect of the Basics Card almost fully offsets the negative effect of income management generally.

This indicates that implementation issues are one reason why we observe a decrease in attendance following income management.

Income management and birth outcomes

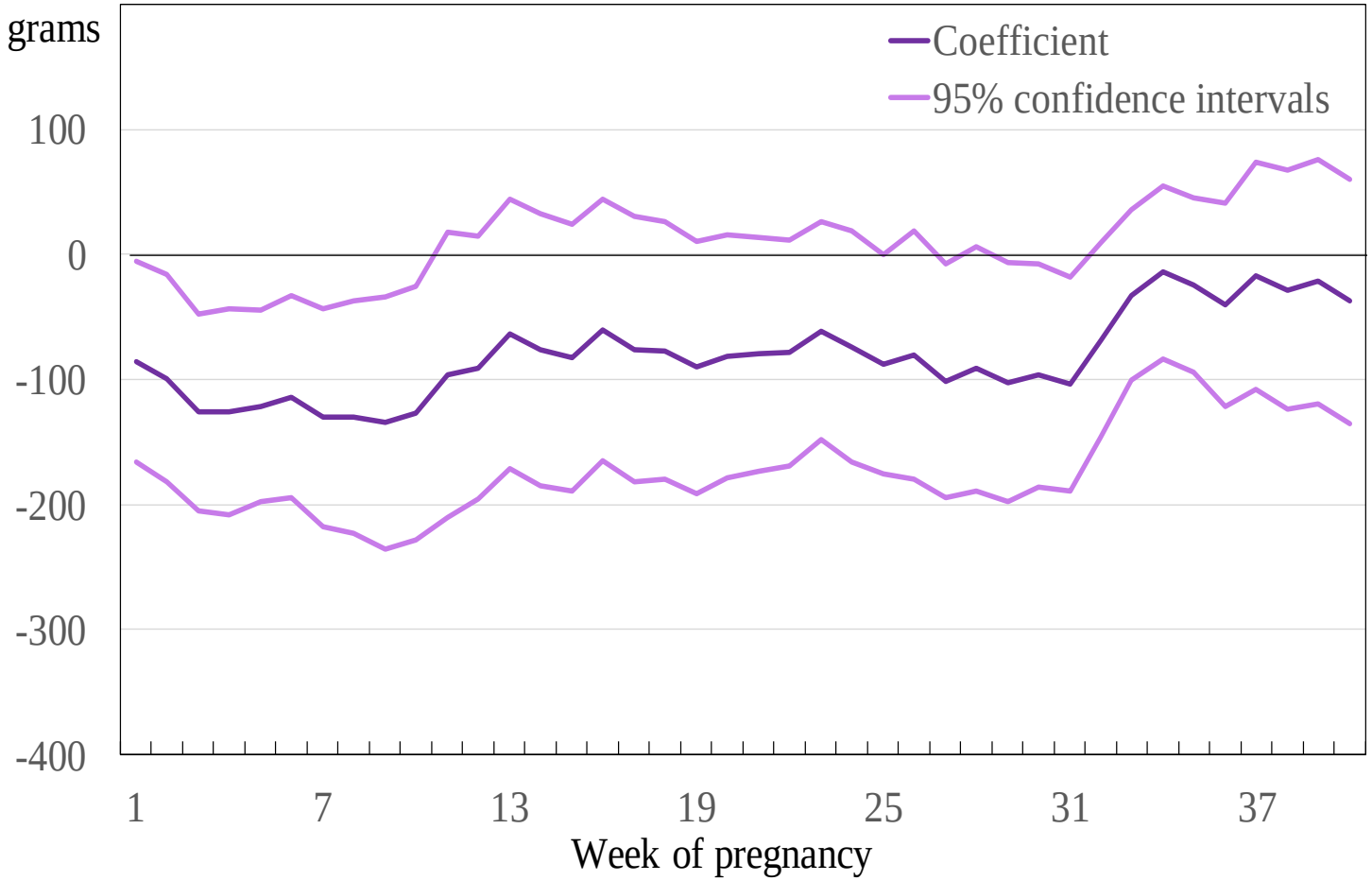
Birthweight – Quantile Regression Coefficients

Treatment effect controlling for year, rain, community fixed effects and prematurity



Impact of Income Management on Birthweight

Regression coefficient if introduced in or before week of pregnancy*



* Controlling for year, rainfall, community fixed effects and prematurity; 5% Winsorised to control for extreme outliers

Main results: Low birth weight

	(1)	(2)	(3)	(4)
Outcome: Low birthweight (marginal effects)				
Income management	**0.0285***	**0.0603*****	**0.0807*****	**0.0480****
	(0.0167)	(0.0205)	(0.0275)	(0.0220)
Rainfall in 3 months to birth (mm)		8.90e-05***	8.54e-05***	7.03e-05***
		(2.02e-05)	(2.92e-05)	(1.85e-05)
Year (base category = 2007)				
2008		-0.0385	-0.0538	-0.0207
		(0.0346)	(0.0445)	(0.0385)
2009		-0.0769**	-0.0990**	-0.0275
		(0.0359)	(0.0447)	(0.0431)
Premature				0.314***
				(0.0155)
Community fixed effects			Yes	Yes
Observations	1,153	1,153	991	991

Implications

Implications

Implementation matters

Unintended consequences need to be considered

Income management has significant administrative costs

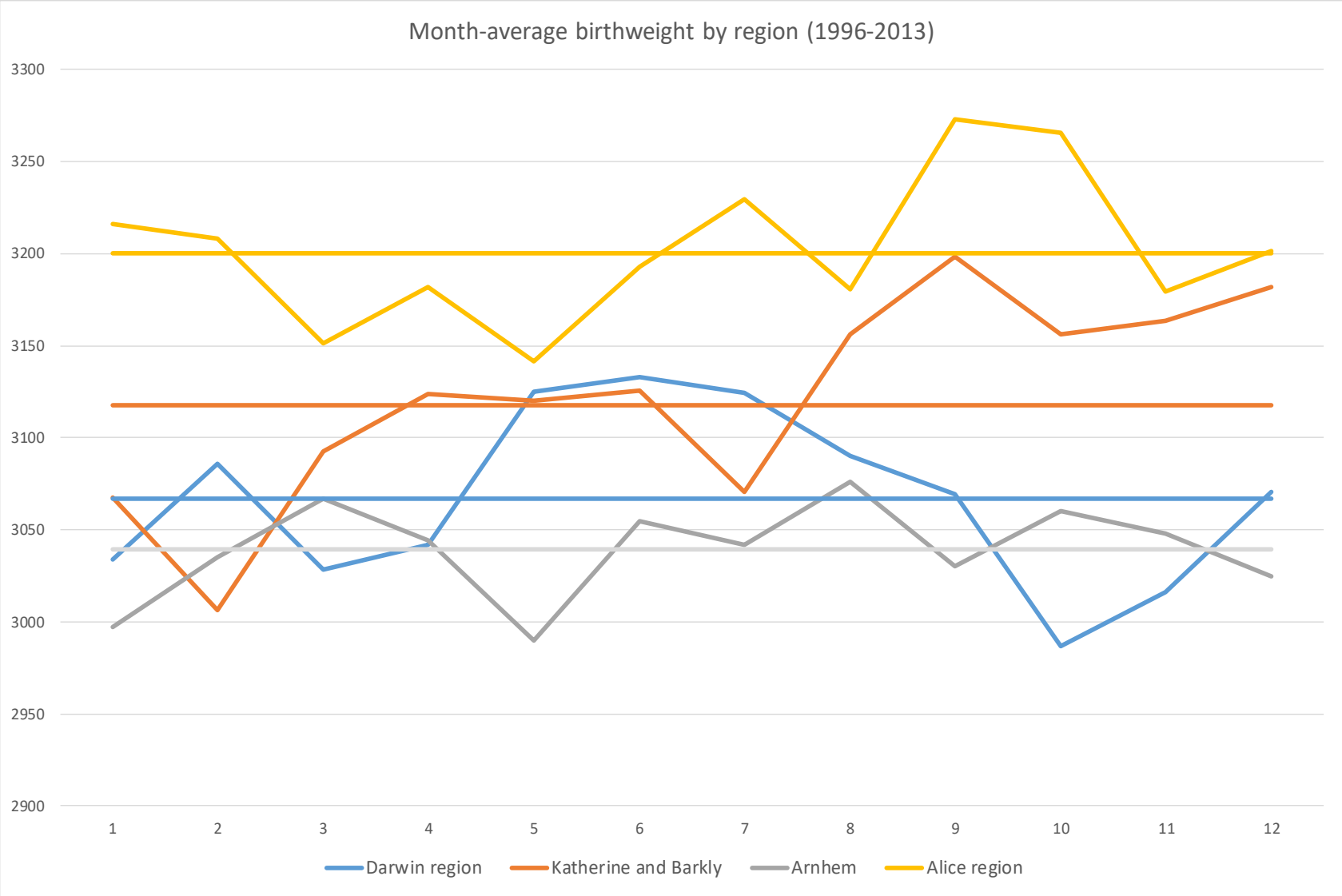
- Administrative costs: $451 million (AUD) in 2007-08 and 2009-10FY, approx. $20,700 per IM-person (see Buckmaster et al., 2012).
- Cashless Debit Card trial costs around $9,000 pp/py, based on total costs of $18.9 million (DSS 2017), and > 2,000 participants (Orima 2017).

There are alternatives: Special Supplemental Nutrition Program for Women, Infants, and Children (federal grants to states, community-controlled health services) – see also Altman (2016, AJSI).

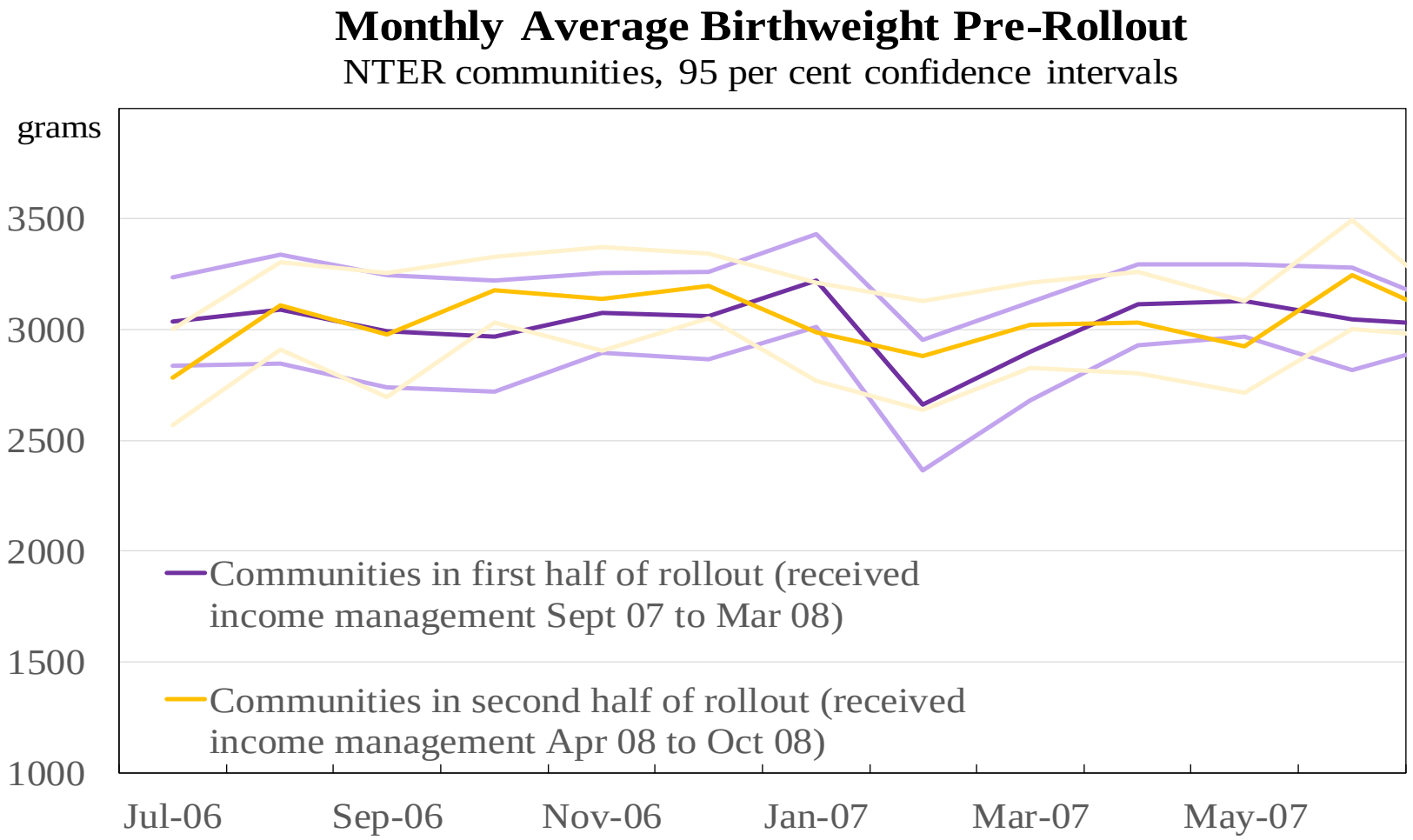
Value of data linkage for evidence-based policy making and systematic evaluation of new programs

Supplementary material

Seasonal variations in birthweight



Assumption: Rollout is not related to pre-treatment trends in BW



Main results: Birth weight

	(1)	(2)	(3)	(4)
Outcome: Birthweight				
Income management	-60.64*	-119.5***	-163.9***	-118.7**
	(35.95)	(44.77)	(55.48)	(52.77)
Rainfall in 3 months to birth (mm)		-0.180***	-0.101*	-0.0873*
		(0.0452)	(0.0598)	(0.0498)
Year (base category = 2007)				
2008		70.94	91.16*	53.14
		(52.96)	(54.23)	(50.52)
2009		160.8	169.8*	64.08
		(97.14)	(94.40)	(90.95)
Premature				-932.9***
				(52.44)
Constant	3,161***	3,175***	3,158***	3,298***
	(23.28)	(45.48)	(38.80)	(32.43)
Community fixed effects	No	No	Yes	Yes
Observations	1,153	1,153	1,153	1,153

Robustness checks

- Different specifications of season controls
- Different sample periods
- Restrict sample to healthy birth range (2500-4000g)
- Alternative estimation strategy (matching)
- Control for maternal behaviours
- Control for changes in health care provision

Mechanisms

Aizer and Currie (2014, Science) review the evidence of the origins of the link between disadvantage and poor birth outcomes:

1. Maternal behaviours during pregnancy (smoking, drinking)? **No.**
2. Poorer access to care? **No.**
3. Reduced calorie intake or nutrient-poor food?
4. Increased stress? (Racism, interpersonal violence, fear)

Nutrition channel: intrauterine growth

- Food stamps: Almond, Hoynes et al. (2011, RESTAT) find that the effect was largest in the US when food stamps were in place for the whole of the third trimester of pregnancy, with no additional impact if introduced earlier – **13-42 grams** for Black and **15-20 grams** for White babies;
- Randomised trials that provide food or fortified food products during pregnancy increase birthweight by **125 grams on average** (Gresham, Byles et al. 2014; AJClNutr, meta-analysis);
- Conditional cash transfers: Oportunidades found a **130 gram** increase in birthweight and a **4.6 percentage point decrease** in probability of low birthweight (Barber and Gertler 2008, TM&IH);
- Ramadan studies: **0-200g** reduction in birthweight depending in study.

Stress channel: cortisol affects baby through placenta

- **Grief:** (admin data from Norway, Sweden):
  - Black et al. (2016, AEJ: Applied) – death of a grandparent while in utero leads to a reduction in birth weigh of **20-30 grams**.
  - Rossin-Slater and Pearsson (Forthcoming, AER): death of any relative – reduction in birth weight by **11 gram,** increase in probability of low birth weight by **12 percent**.
- **Racism:** Lauderdale (2006, Demography): Perceived racism following Sep 11, 2001 in California: increase in odds of low birth weight by 2.5.
- **Hurricanes:** Currie and Rossin-Slater (2014, JHE): increase in low birth weight if exposed in third trimester by 27%.

Details on Income Management

- 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.
- One-off payments (including the Baby Bonus) were subject to 100 percent income quarantining.

Income management applied to all recipients of these benefits unless they obtained an exemption. Exemptions (3% of cases) 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.

Quarantined income could not be spent on alcohol, tobacco, pornography or gambling.

BACK

BACK

Measure	Possible outcome	Implementation timing	Assessment
Expanding Health Services Delivery Initative	Better prenatal care and child health outcomes	July 2008 onwards	Minimal overlap with IM
Alcohol restrictions	Increase in food spending (as alcohol spending no longer possible), and decrease in maternal health complications	Immediately following NTER Act (August 2007)	No overlap with IM
Night patrols	Community safety	Gradual, but on a slower timeline to than IM (31 operating by 30/6/08, 42 on consultation. Rollout complete by Dec-09). Night patrols already existed in 23 communiteis pre-NTER.	Different timeline from IM
School nutrition program		Rollout by July 2008. But very low takeup rates.	Different rollout timeline, and unlikely to affect birth outcomes.
Child health checks	All children under 15 eligible.	Began in 16 central communities in late July 2007, rolled out to other communities by early 2008.	Different rollout timeline, unclear if prenatal health check were included.
Store licensing	Increased supply of nutritional food. Precondition for IM rollout.	92 licensed from 1 July 2007 to 31 December 2010.	Much slower rollout timeline than IM. Some stores were given provisional licenses (so probably didn't see immediate change in nutritious food), and some communities would have already had better supply of nutritious food (eg town camps).
Change in Centrelink claim rate	When each IM participant met with a Centrelink case officer, some found out that they were eligible for higher payments, others found out they were not eligible for their current payments and had them cancelled.	This was a direct result of the IM rollout, so same rollout timing. People in some communities (which had long consultation periods) may have met with case managers early and been moved to higher payments before IM rollout.	Affected only around 6 per cent of clients who were income managed at some point during the rollout period.
Employment measures	More jobs, households have more money available to spend on childrens' health/education.	From July 2007 to December 2010, 4,100 job placements.	Different rollout schedule.
Increased police presence	Safer communities, lower stress for pregnant women.	New police presence in 18 communities by 30/06/08. Some communities already had a police presence.	Not affecting all communities, different rollout timeline.
Money management trainning	May lead to increased household food consumption due to better budgeting.	40 communities received some training before IM rollout.	Trainning was only received by around half of the NTER communities. We do not know which communities received the training and what the training involved.

[1] Sources: AIHW 2010; FaHCSIA 2011

Timing of IM: Birth weight

	(1)	(2)	(3)	(4)
Controls	None	Year controls and rainfall	Year, rainfall + community FE	Year, rainfall, community FE and premature
Timing of IM introduction (Omitted category = born before income management introduced in community)				
Before or during first trimester	-34.11	-88.85	-183.6*	-160.9*
	(58.09)	(76.52)	(95.13)	(88.50)
During second trimester	-30.67	-79.47	-95.29	-80.31
	(43.70)	(58.00)	(66.69)	(56.11)
During third trimester	119.4*	85.22	66.23	16.66
	(60.53)	(66.25)	(76.37)	(66.16)

Differences by region

	Sample size	Birth weight	Low birthweight
Darwin region	329	-301.5***	0.103***
		(72.89)	(0.0354)
Central (Katherine and Barkly)	269	-12.53	-0.0550
		(108.3)	(0.0467)
Arnhem region	224	-185.3*	0.0753**
		(97.82)	(0.0332)
Alice region	331	-85.69	0.0840*
		(98.66)	(0.0452)
Control for premature		yes	yes