



Center for Violence and Injury Prevention

GEORGE WARREN BROWN  
SCHOOL OF SOCIAL WORK



Washington University in St. Louis

# **“Big Data”: Understanding Children’s Cross-System Involvement and Practical Translation of Findings**

Children’s Data Network

University of Southern California

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## Why bother with this big data stuff? Why not just do intervention?

- I would argue this is not an either/or situation but one in which both are key to policy and successful implementation of evidence-based effective approaches. (Also important in evaluation.)
- Not knowing what we do “usual care” (and we know surprisingly little about a lot of things) is, in my opinion, like driving to a destination with no map.



Excuse me Ms!!! Do you know the way to the 4th tree on the left?



# Today

- I am going to talk a bit about the dataset we created using multi-system information in Missouri and how it informs our understanding of cross-system involvement
- I am then going to focus on an example of how we used information from one analysis to translate it into testing a means of improving services to young families involved with child protective services.



## Origins of work

- Our work really began based on research questions with a strong history of agency collaboration.
- Since this is not the same as creating an ongoing data system to continually understand children's paths to and through services I will spend a little time explaining our sample to provide some context for the results to be discussed.



# Who is in the sample??

## Hotline records, child welfare services and AFDC

CA/N: Families with all known children under age 12 with a FIRST report of abuse or neglect in 1993-1994

1 child randomly selected matched by region and birth year

Poverty: Families with all known children under age 12 on AFDC

CA/N + poverty

- 0-11 yrs old
- Born '82-94

Poverty Only

- 0-11 yrs old
- Born '82-94

CA/N Only

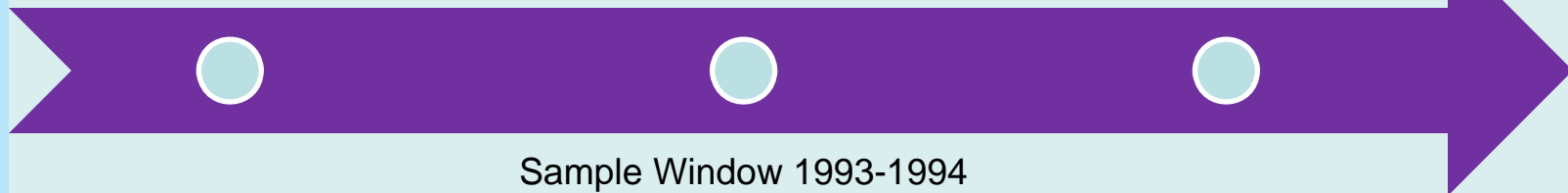
- 0-11 yrs old
- Born '82-94



## Example study: Time Period and Sample Groups

Data Available from Prior to  
Sampling Period  
(birth, some health care,  
caregiver criminal history,  
AFDC, child welfare)

End of Analyses:  
2009  
Adolescence- Young  
Adulthood



Sample Window 1993-1994  
Childhood/adolescence  
(NIH funded initially with CDC  
grant to extend follow-up)

Baseline Group	Later CAN	Later AFDC	Remain "Original Status"
Poverty Only (n=5107)	1695	--	3412 (67%)
CA/N Only (n=2234)	--	383	1851 (83%)
CA/N & AFDC (n=5073)	--	--	5073 (100%)

Note differences in matched groups occur due to loss of information in data cleaning...

DATA SOURCE	Main Kinds of Data Used
<b>Child Welfare</b>  <i>Gives us information about both the parent and the child. Can also give information about the parent when that parent was a child. Can also give information about the grown child later, as a parent.</i>	Report and Investigation Dates, types (5 per report), substantiation
	Relationship to perpetrator
	Change of Address
	In-home service type*, dates, units provided
	Dates of in-home services
	Units of services provided
	Foster or group care entry & exit dates, reason, type
<b>Department of Corrections</b>	Parent and later child subject dates and reasons
<b>Department of Mental Health</b>	Dates of services and diagnoses and program type
<b>Income Maintenance (AFDC at start of study then TANF)</b> <i>Child's family as well as grown child as adult recipient</i>	Ongoing dates of receipt of aid, reason for case opening- family of subject Later track subject use (but typically limited to females)
<b>Medicaid prior to managed care</b> <b>Children and parents</b>	Dates of service
	Diagnoses (as defined in the ICD-9 codebook)
	Types of Service
<b>Missouri Health Net (Child only)</b>	Dates of service, provider type, diagnoses
<b>ER Data</b>	ICD-9 diagnoses (6 per visit), dates, admission, discharge
<b>Special Education</b>	Dates of service
	Diagnoses/ disability type
	Placement or Service Provided
	Outcomes
<b>Vital Statistics</b>	Death (child) Birth (Child and Child's Children), marriage (child subject)
<b>Special Education (St. Louis Metro)</b>	Disability type
<b>Department of Youth Services</b>	Incarceration , Reason for incarceration
<b>Runaway Shelters</b>	Dates, last place of residence, some intake information
<b>Highway Patrol</b>	Arrests: type, date
<b>Local Juvenile Courts (St. Louis Metro)</b>	Charges, dates
<b>Census</b>	Wide range of neighborhood variables



# PERSEVERANCE

"DO OR DO NOT. THERE IS NO TRY"





## **This work does take time**

For example,

- First the informal agreements before the funding came
- Then our IRB
- Then judges, health department formal IRB, child welfare research review committee, individual administrators....
- Some of it was free – YAY! Some of it turned out to require we look at case files because their electronic data was too unreliable and some agencies charged for data– BOO!

None of it was created for us....

- So there is a substantial investment in data cleaning and programming over time



**SO WHAT ARE SOME  
EXAMPLES OF THE TYPES OF  
FINDINGS PRODUCED?**



## Cross-system Outcomes: Do Children Reported for Maltreatment Represent a Higher Need Group than Other Disadvantaged Children?

Table 2

Logistic regression analyses for eight different outcomes for children/adolescents

	Mental health services	Status offending	Delinquency (non-violent)	Delinquency (violent)	Other disability (not mental health)	ER/hospital care: violent injury	ER/hospital care: head or fracture (unintentional)	ER/hospital care: teen pregnancy
Of color	0.84*	0.61***	1.52***	1.93***	1.18*	1.28	0.86*	1.35*
Female	0.68***	0.74***	0.44***	0.53***	0.59***	0.50***	0.58***	N/A
Birth year	0.98	0.88***	0.87***	0.87***	1.01	0.96*	1.08***	0.76***
Child disability	1.18*	1.01	1.22**	1.33**	N/A	1.40**	1.44***	1.27*
Parent <=20 at birth	0.98	1.05	1.08	0.97	0.95	1.23*	1.05	1.10
Parent sub. Ab. Tx	1.04	1.04	1.23	1.26	0.95	0.75	0.95	1.05
Parent MH Tx	1.49**	1.31*	1.11	0.92	1.27*	1.23	1.15	1.22
Parent DD	1.27	1.19	1.11	1.09	1.16	1.33	0.99	0.99
Tract Inc	1.00	1.00	1.00	1.01	0.99	0.99**	1.00	0.98**
CAN/AFDC	4.13*** (1.79***)	3.29*** (3.00***)	2.07*** (1.82***)	2.69*** (1.94***)	2.25*** (1.12)	1.77*** (2.31***)	1.44*** (1.79***)	2.14*** (2.06***)
AFDC Only	1.00 (0.43***)	1.00 (0.91)	1.00 (0.88)	1.00 (0.72*)	1.00 (0.50***)	1.00 (1.31)	1.00 (1.25*)	1.00 (0.96 )
CAN Only	2.31*** (1.00)	1.10 (1.00)	1.14 (1.00)	1.39* (1.00)	2.01*** (1.00)	0.76 (1.00)	0.80** (1.00)	1.04 (1.00)
Wald X <sup>2</sup> (df)	272.21 (11)	485.73 (11)	464.40 (11)	361.55 (11)	219.88 (10)	187.56 (11)	361.55 (11)	356.71 (10)
Significance, c=	p<.0001, c=.68	p<.0001, c=.69	p<.0001, c=.68	p<.0001, c=.69	p<.0001, c=.63	p<.0001, c=.68	p<.0001, c=.63	p<.0001, c=.73

\*p<=.05, \*\*p<=.01, \*\*\*p<=.0001.

Note: Bracketed Values in last three rows show "CAN Only" as the reference group, non-bracketed values use AFDC Only as the reference group.

Note: Identical Chi-Square values in columns 5 and 8 are actual, not typographical.

- Yes, those with maltreatment reports had higher risk of a range of untoward events captured by different systems (Jonson-Reid, Drake, & Kohl, 2009).



## Okay why should you care?

- There is an important difference between Disparity and Disproportionality.
- Sometimes we wonder if we just happen to be seeing a group of families that are no better or worse than anyone else—just being unfairly “watched”
- If children reported are at higher risk than other similarly socioeconomically disadvantaged groups, then their representation in systems is due to the DISPARITIES they face both within their families as well as access to quality and timely services in the community.
- This means that most of these children and families are correctly being identified as needing help
- ‘Big data’ can help us ask these types of questions....

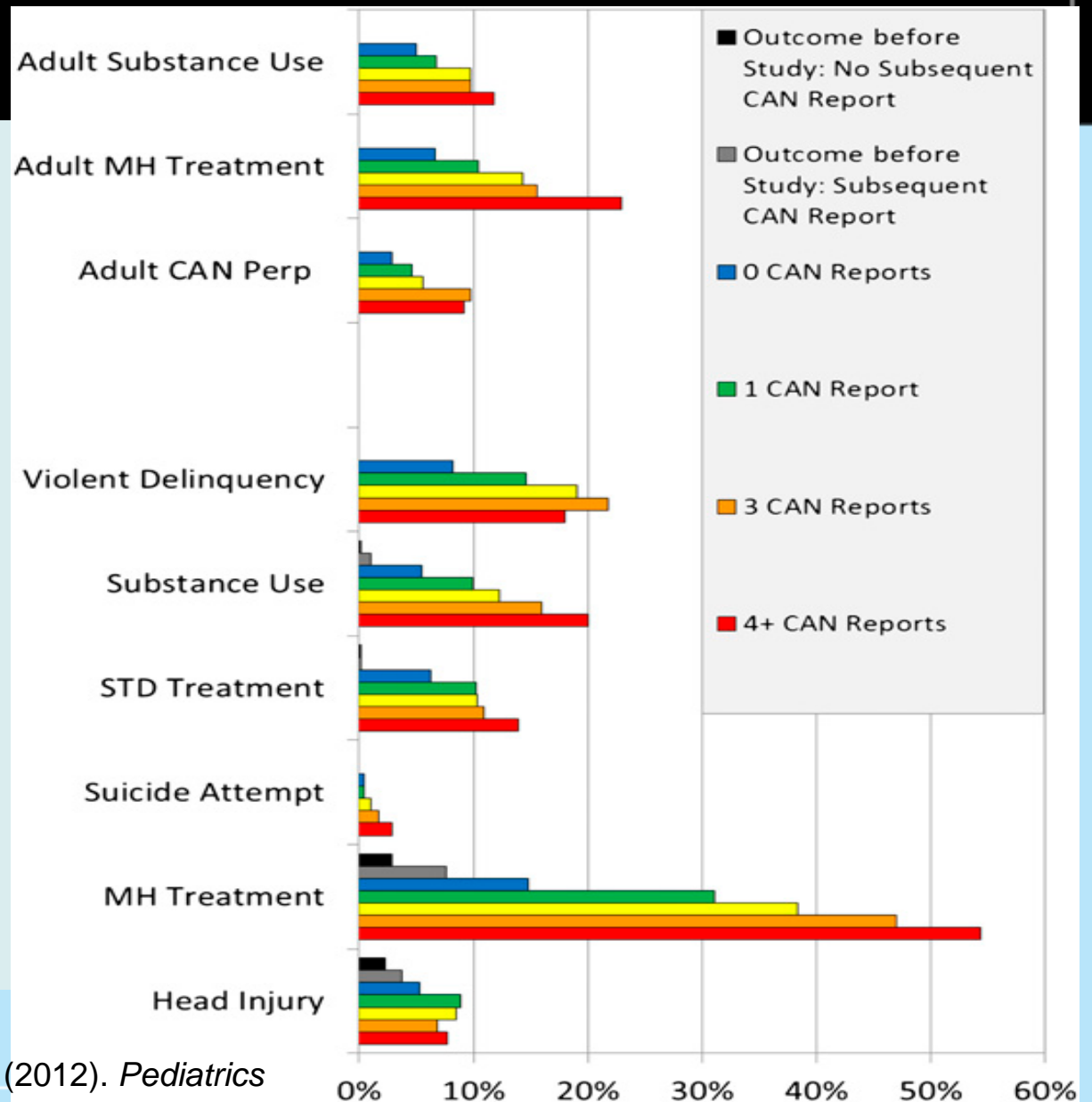


## Big Data Can Also Help Us Identify Key “Turning Points”

Ending recurrence—even when we can only use administrative data—matters....for a long time.

Blue bars are the ‘never maltreated group’ compared to those with 1,2,3, or 4+ reports over time.

Adult outcomes control for the outcomes in adolescence below.



Jonson-Reid, M., Kohl, P. & Drake, B. (2012). *Pediatrics*



## **Preventing re-reports of maltreatment seems like a good idea**

- Here is a variable easily measured by administrative data, that seems to capture a good amount of variability related to other outcomes that can also be measured with these types of data
- These outcomes can be assessed in terms of cost

Of course, we were limited to a single cohort so we did not have the flexibility to assess the impact of a program change....but your data network could!



## What if you had ongoing data like this?

- Well—imagine you knew what the baseline recurrence rate of maltreatment reports was and THEN successfully implemented programming to reduce that.
- You could re-run analyses like this and not only see if the rates of reports dropped but also if the outcomes in other systems were impacted...helps us understand costs and benefits



## Okay, but how about informing practice for young children?

In one of our first published papers using these data, we examined the relationship between maltreatment and entry into special education.

**Before** we had the data to look at this prospectively---most of our agency stakeholders assumed the sequence was:

School  Child Abuse Report

**We found:** Child Abuse Report  School

In fact, the initial child welfare contact was often in early childhood over **5-8** years prior to school identification.

— (Jonson-Reid, M, Drake, B., Kim, J., Porterfield, S. & Han, L. (2004).





## Here lies the importance of continued research and field collaboration

- We made a commitment to have an ongoing discussion with our agency stakeholders over time to discuss results.
- In this case, we brought together early childhood, special education and child welfare representatives to discuss this finding.





## From administrative data to local programming

**5-8** years is a long enough period to potentially impact later outcomes

- Getting vulnerable families connected to services that might improve developmental outcomes as early as possible might offset later problems.

But, it was possible the agencies had already figured this out

- The discussion of findings within a collaborative group allowed us to consider whether this was still occurring and what was both potentially effective and feasible for the agencies involved.



## Early Childhood Connections

- We had a pre-existing Parents as Teachers program that was not reaching the highest risk families
  - The staff could actually get higher reimbursement if we could help make that connection
- The hotline workers and in-home services workers were receiving no training on early childhood or available services
  - Case outcomes might improve if families were receiving timely in-home parenting support and might be more receptive to a program that was outside child welfare...



## Full circle...

- Administrative data was used to identify a potential point of intervening at a system level for young children
- That same type of data would later be used to measure at least one outcome (child maltreatment reports) to help us understand the benefit to the participating agency
- Though not available in our case, with the system you are developing you might also have access to kindergarten screening records or early childhood school records as well as special education records to measure benefits to the schools.



# Thanks

- There are a lot of people involved in this type of project
  - Many administrative and line staff at agencies have collaborated with us over the years
  - Lu Han (Data Programmer)
  - Faculty: myself, Brett Drake, Patricia Kohl and others over the years
  - Doctoral students (multiple RAs and 5 dissertations)
  - Masters students (data entry from case files, background help with articles...)
  - NIMH, DOE, NIJ and CDC have all contributed financial support over time



## Articles referenced

- Jonson-Reid, M., Kohl, P. & Drake, B. (2012). Child and Adult Outcomes of Chronic Child Maltreatment *Pediatrics*. 129(5):839-45. NIHMS 436968
- Jonson-Reid, M., Drake, B., Kohl, P. (2009). Is the overrepresentation of the poor in child welfare caseloads due to bias or need? *Children & Youth Services Review*, 31,422-427. \_NIHMS 156129. [Pro Humanitate Literary Award]
- Jonson-Reid, M, Drake, B., Kim, J., Porterfield, S. & Han, L. (2004). A Prospective Analysis of the Relationship Between Reported Child Maltreatment and Special Education Eligibility Among Poor Children. *Child Maltreatment*, 9, 382-394.

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