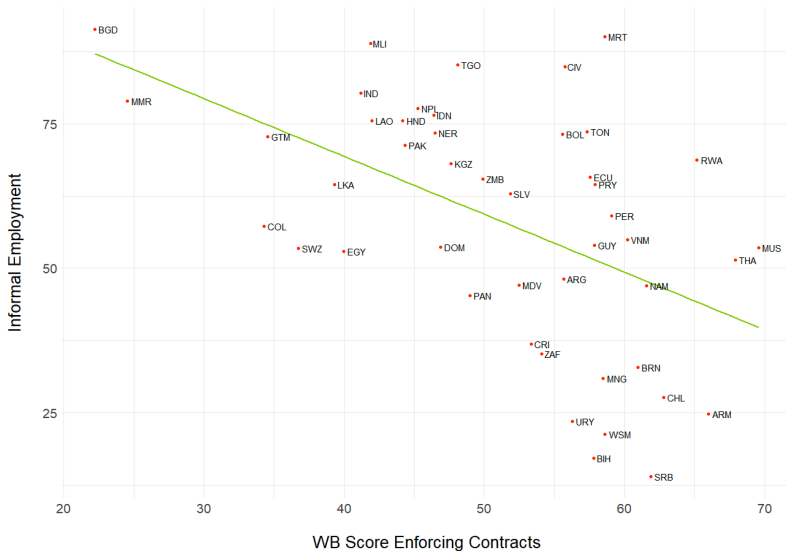


Data Science for Justice:
Reducing Market-Level Constraints to Economic Development
through Rule of Law

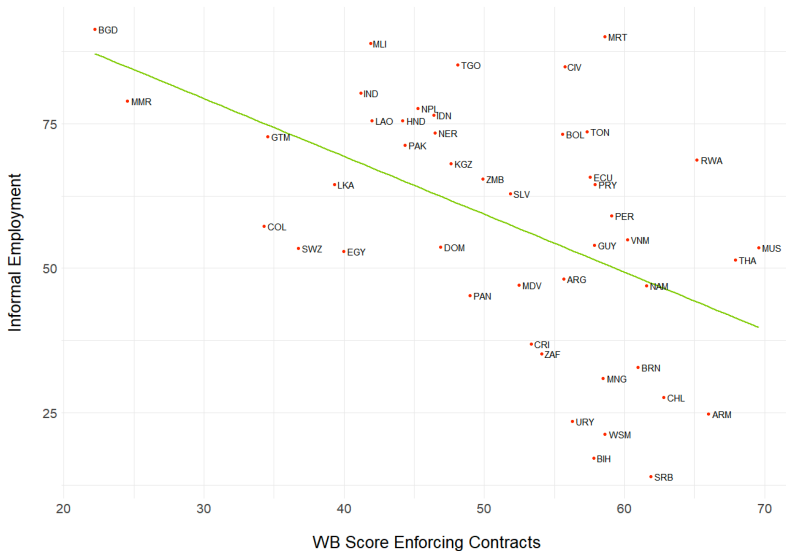
Daniel L. Chen

Economic development & legal institutions are associated



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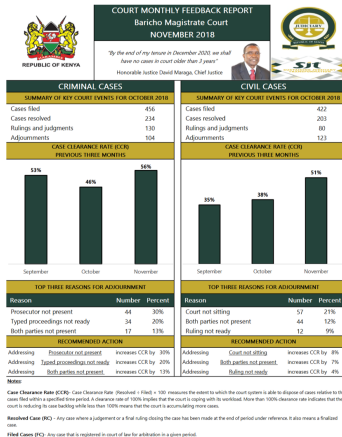
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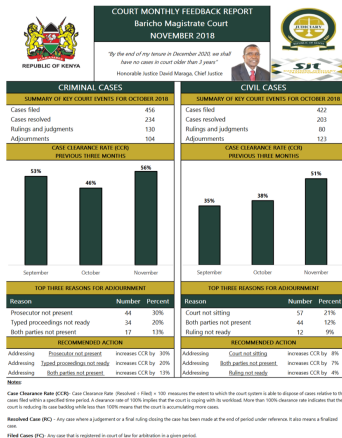


Can AI provide actionable recommendations

Improve the functioning of courts

Unlock the positive effects of justice on economic development?

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Conceptual Framework

- Principal-agent model

- ▶ The principal (Chief Justice, CJ) wishes the agents (the judges) to exert effort and resolve cases fast.
- ▶ Absent the one-pagers, the agents' effort is unobservable, and thus can be provided at suboptimal low levels.
- ▶ Increasing the **monitoring** of agents through the one-pagers (which measure and reveal judges' effort) thus increases judges' effort.
- ▶ Civil society **accountability** introduces a new principal
- ▶ The general population wants faster justice
- ▶ Forums help monitor all groups that can contribute to delays

- If courts are slow

- ▶ citizens will not use them, resulting in inefficient ways to do business
- ▶ informal networks to prevent any expropriation

- Contract enforcement facilitates relationship-specific investments

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Contract enforcement and economic development

- Suppose a firm contracts with a supplier to produce a customized good
 - ▶ Once the supplier has sunk the investment costs to produce the customized good, the buyer can renegotiate prices down
 - ▶ The supplier can sue in court, but typically recovers only a fraction
 - ★ NPV of recovery decreases with court delay
 - ▶ Slow courts depress reliance, investments, and productivity

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Intervention

- Experimental design ($N = 124$ court stations):
 - ▶ Control group
 - ▶ Treatment 1: Feedback report
 - ▶ Treatment 2: Feedback report + Court User Committee
- Outcomes:
 - ▶ Adjournment, Case delay
 - ▶ Quality (citizen satisfaction, opinion quality)
 - ▶ Economic development

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Select court station name/ division:													
2														
3	1			2					3				4	
4	Today's date (Required for every entry.)			Case Number (Including date case was registered) (Required for every entry.)					*Appeal cases only: Enter court station where case is coming from & its case number. (Required for cases being appealed.)				Select case type: (Required for every entry.)	
5	Day	Month	Year	Code	No.	Day	Month	Year	(Select name)	Code	No.	Year	(Select type)	
6	1													
7	2													
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9 million observations on daily case activities, 2015-

Delays (Adjournments): Lawyer not ready (9%), Parties not ready (13%),
Parties not present (13%), Witness not present (17%)

Clear remedies in Kenyan Law that address these delays

e.g., active case management (pre-trial conference)

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Treatment



REPUBLIC OF KENYA

COURT MONTHLY FEEDBACK REPORT

Baricho Magistrate Court

NOVEMBER 2018

"By the end of my tenure in December 2020, we shall have no cases in court older than 3 years"

Honorable Justice David Maraga, Chief Justice

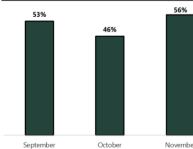


CRIMINAL CASES

SUMMARY OF KEY COURT EVENTS FOR OCTOBER 2018

Cases filed	456
Cases resolved	234
Rulings and judgments	130
Adjournments	104

CASE CLEARANCE RATE (CCR) PREVIOUS THREE MONTHS



TOP THREE REASONS FOR ADJOURNMENT

Reason	Number	Percent
Prosecutor not present	44	30%
Typed proceedings not ready	34	20%
Both parties not present	17	13%

RECOMMENDED ACTION

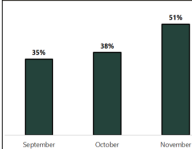
Addressing	<u>Prosecutor not present</u>	Increases CCR by	30%
Addressing	<u>Typed proceedings not ready</u>	Increases CCR by	20%
Addressing	<u>Both parties not present</u>	Increases CCR by	13%

CIVIL CASES

SUMMARY OF KEY COURT EVENTS FOR OCTOBER 2018

Cases filed	422
Cases resolved	203
Rulings and judgments	80
Adjournments	123

CASE CLEARANCE RATE (CCR) PREVIOUS THREE MONTHS



TOP THREE REASONS FOR ADJOURNMENT

Reason	Number	Percent
Court not sitting	57	21%
Both parties not present	44	12%
Ruling not ready	12	9%

RECOMMENDED ACTION

Addressing	<u>Court not sitting</u>	Increases CCR by	8%
Addressing	<u>Both parties not present</u>	Increases CCR by	7%
Addressing	<u>Ruling not ready</u>	Increases CCR by	4%

Notes:

Case Clearance Rate (CCR) - Case Clearance Rate (Resolved + Filed) x 100 measures the extent to which the court system is able to dispose of cases relative to the cases filed within a specified time period. A clearance rate of 100% implies that the court is coping with its workload. More than 100% clearance rate indicates that the court is reducing its case backlog while less than 100% means that the court is accumulating more cases.

Resolved Case (RC) - Any case where a judgement or a final ruling closing the case has been made at the end of period under reference. It also means a finalized case.

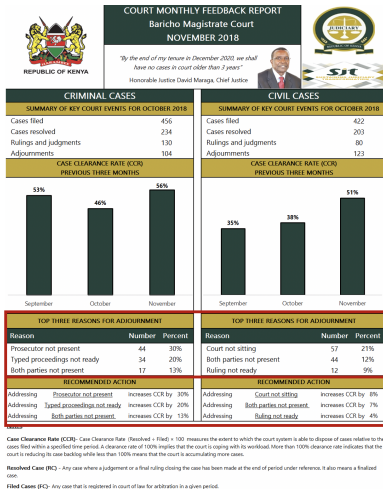
Filed Cases (FC) - Any case that is registered in court of law for arbitration in a given period.

Data-Driven Recommendations

Efficiency in Kenya:
Can low cost, 'actionable'
information improve performance?

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Analyze and present (localized) correlates of delay

Intervention

- Step 1:

$$CCR_{cm} = \beta_0 + \beta_{adj} Adj_{cm} + \alpha_c + \delta_m + \varepsilon_{cm} \quad (1)$$

- Step 2:

- ▶ Predict for each court each month
- ▶ Increase in CCR if $Adj_{cm} = 0$

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- One court station has one Court User Committee,
 - ▶ All the courts within that court station (T1) receive a one-pager
 - ▶ All the courts within that court station (T2) have all members of the CUC also discuss the one-pager in quarterly meetings
- Experimental design:

Kenya has 124 court stations. To achieve balance, we stratify on

- ▶ geographical variables
- ▶ fast versus slow court stations.

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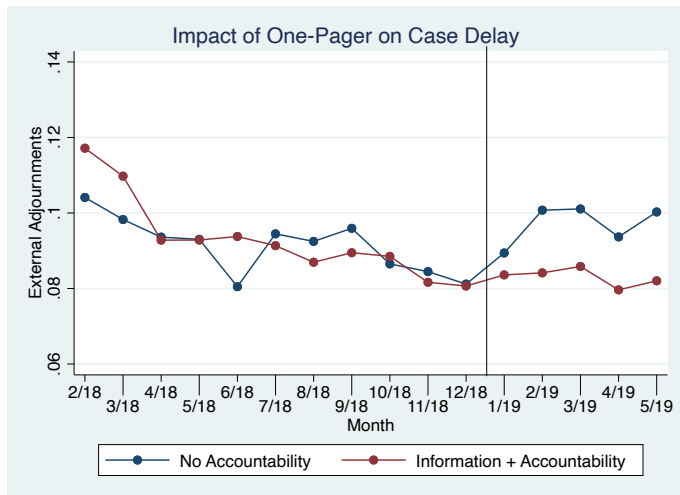
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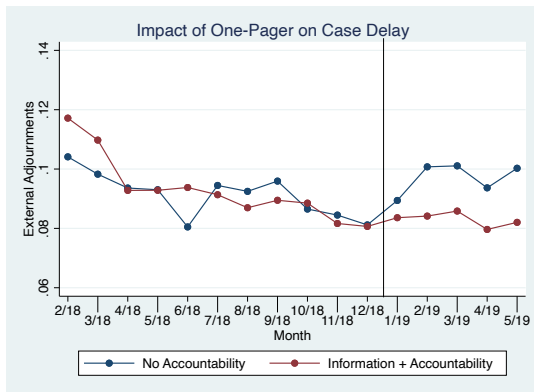
Intervention

- First wave sent in February 2019

Results

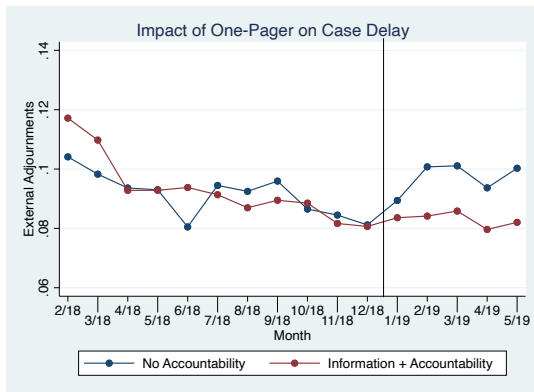


Accountability reduced adjournments



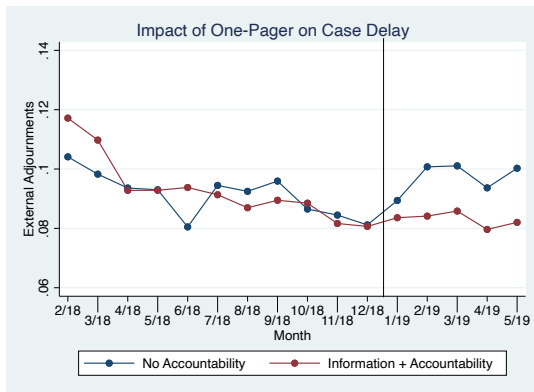
- Effect size suggests 20 percent impacts
- Compound effects: adjournments for another hearing
 - ▶ The mean number of hearings per case is 4.63
- Translates into a reduction of 107 days in trial length, or 22%

Accountability reduced adjournments



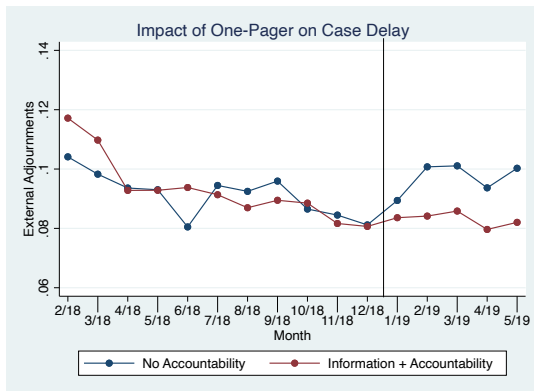
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- controlling for representation, charge, witness, judge identity, parties..

	Adjournment	External Adjournment	Internal Adjournment
OnePager * February 2019	-0.014 (0.012)	-0.017 (0.011)	0.000065 (0.0043)
OnePager CUC * February 2019	-0.031** (0.015)	-0.030** (0.013)	-0.0042 (0.0043)
OnePager * March 2019	0.0016 (0.013)	0.0028 (0.011)	-0.00028 (0.0041)
OnePager CUC * March 2019	-0.017 (0.015)	-0.022* (0.011)	0.0014 (0.0040)
OnePager * April 2019	-0.012 (0.014)	-0.0044 (0.012)	-0.0076 (0.0063)
OnePager CUC * April 2019	-0.025 (0.016)	-0.023* (0.012)	-0.0070 (0.0063)
OnePager * May 2019	0.012 (0.017)	0.018 (0.015)	-0.0020 (0.0053)
OnePager CUC * May 2019	-0.013 (0.017)	-0.012 (0.015)	-0.0026 (0.0049)
OnePager * After June 2019	0.0058 (0.014)	0.0064 (0.012)	0.00013 (0.0038)
OnePager CUC * After June 2019	-0.0070 (0.016)	-0.015 (0.013)	-0.00027 (0.0043)
OnePager * Month Before	-0.0089 (0.013)	-0.0030 (0.0091)	-0.0069 (0.0053)
OnePager CUC * Month Before	-0.0074 (0.013)	-0.010 (0.011)	-0.0084 (0.0053)
Observations	6162668	6399868	6399868

- This intervention reduced the probability of adjournment by 3% (as in raw data)
- Effect sizes are large relative to baseline of 18%

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Adjournments

- “External” adjournments (74%): caused by other actors:
 - ▶ Top adjournment reasons (52%): Lawyer not ready (9%), Parties not ready (13%), Parties not present (13%), Witness not present (17%)
 - ▶ advocate not present, prosecutor not ready, prosecutor not present, witness not ready, death of a party, expert report not ready, file missing, judge on transfer, no exhibits, no proof of service, parties to negotiate, no interpreter, matters cannot be reached, expert witness absent, accused not ready, accused not present, faulty charge sheet, accused not supplied with witness statements/relevant documents, police file not availed, other
- “Internal” adjournments (26%): caused by the court itself:
 - ▶ court not sitting, court on its own motion, judgment not ready, ruling not ready, matters not cause listed, no reason recorded, typed proceedings not ready, submission not ready, recusal, court on leave, court on official duty, court indisposed

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Accountability mechanism

					Same as on One-Pager	Different as on One-Pager
OnePager * February 2019	-0.013 (0.012)	-0.012 (0.012)	-0.012 (0.012)	-0.0040 (0.012)	-0.015* (0.0085)	0.0026 (0.0092)
OnePager CUC * February 2019	-0.028** (0.014)	-0.028** (0.014)	-0.028** (0.014)	-0.023 (0.014)	-0.018** (0.0091)	-0.0066 (0.010)
OnePager * March 2019	0.0012 (0.013)	0.0016 (0.013)	0.0016 (0.013)	0.013 (0.014)	-0.0046 (0.0081)	0.0091 (0.0098)
OnePager CUC * March 2019	-0.015 (0.014)	-0.017 (0.015)	-0.017 (0.015)	-0.016 (0.014)	-0.014* (0.0078)	-0.0018 (0.010)
OnePager * April 2019	-0.012 (0.014)	-0.011 (0.014)	-0.011 (0.014)	-0.0030 (0.013)	-0.010 (0.010)	0.00078 (0.011)
OnePager CUC * April 2019	-0.024 (0.015)	-0.024 (0.016)	-0.024 (0.016)	-0.032** (0.014)	-0.019* (0.010)	-0.0058 (0.011)
OnePager * May 2019	0.0099 (0.017)	0.010 (0.017)	0.010 (0.017)	0.0023 (0.015)	-0.0030 (0.014)	0.027** (0.014)
OnePager CUC * May 2019	-0.014 (0.017)	-0.018 (0.017)	-0.018 (0.017)	-0.021 (0.015)	-0.013 (0.014)	0.0041 (0.012)
OnePager * After June 2019	0.0028 (0.017)	0.0035 (0.016)	0.0035 (0.016)	-0.0015 (0.011)	0.0012 (0.0066)	0.0044 (0.013)
OnePager CUC * After June 2019	-0.00027 (0.019)	-0.0030 (0.019)	-0.0030 (0.019)	-0.020 (0.015)	-0.0050 (0.0077)	0.00035 (0.014)
OnePager * Month Before	-0.0090 (0.013)	-0.0082 (0.013)	-0.0082 (0.013)	-0.0018 (0.013)	-0.0031 (0.0083)	-0.0027 (0.0099)
OnePager CUC * Month Before	-0.0063 (0.013)	-0.0065 (0.013)	-0.0065 (0.013)	-0.0050 (0.014)	-0.0100 (0.0094)	0.0046 (0.011)
Case Code Fixed Effects		Yes	Yes	Yes		
Controls			Yes	Yes		
Judge Fixed Effects				Yes		
Observations	8641819	8464456	8464456	7074897	9047041	9047041

- Evidence of judicial learning (judge fixed effects)
- .. from the One-Pager (compare last two columns)

Accountability mechanism

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OnePager * February 2019	-0.013 (0.012)	-0.012 (0.012)	-0.012 (0.012)	-0.0040 (0.012)	-0.015* (0.0085)	0.0026 (0.0092)
OnePager CUC * February 2019	-0.028** (0.014)	-0.028** (0.014)	-0.028** (0.014)	-0.023 (0.014)	-0.018** (0.0091)	-0.0066 (0.010)
OnePager * March 2019	0.0012 (0.013)	0.0016 (0.013)	0.0016 (0.013)	0.013 (0.014)	-0.0046 (0.0081)	0.0091 (0.0098)
OnePager CUC * March 2019	-0.015 (0.014)	-0.017 (0.015)	-0.017 (0.015)	-0.016 (0.014)	-0.014* (0.0078)	-0.0018 (0.010)
OnePager * April 2019	-0.012 (0.014)	-0.011 (0.014)	-0.011 (0.014)	-0.0030 (0.013)	-0.010 (0.010)	0.00078 (0.011)
OnePager CUC * April 2019	-0.024 (0.015)	-0.024 (0.016)	-0.024 (0.016)	-0.032** (0.014)	-0.019* (0.010)	-0.0058 (0.011)
OnePager * May 2019	0.0099 (0.017)	0.010 (0.017)	0.010 (0.017)	0.0023 (0.015)	-0.0030 (0.014)	0.027** (0.014)
OnePager CUC * May 2019	-0.014 (0.017)	-0.018 (0.017)	-0.018 (0.017)	-0.021 (0.015)	-0.013 (0.014)	0.0041 (0.012)
OnePager * After June 2019	0.0028 (0.017)	0.0035 (0.016)	0.0035 (0.016)	-0.0015 (0.011)	0.0012 (0.0066)	0.0044 (0.013)
OnePager CUC * After June 2019	-0.00027 (0.019)	-0.0030 (0.019)	-0.0030 (0.019)	-0.020 (0.015)	-0.0050 (0.0077)	0.00035 (0.014)
OnePager * Month Before	-0.0090 (0.013)	-0.0082 (0.013)	-0.0082 (0.013)	-0.0018 (0.013)	-0.0031 (0.0083)	-0.0027 (0.0099)
OnePager CUC * Month Before	-0.0063 (0.013)	-0.0065 (0.013)	-0.0065 (0.013)	-0.0050 (0.014)	-0.0100 (0.0094)	0.0046 (0.011)
Case Code Fixed Effects		Yes	Yes	Yes		
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OnePager * March 2019	0.0012 (0.013)	0.0016 (0.013)	0.0016 (0.013)	0.013 (0.014)	-0.0046 (0.0081)	0.0091 (0.0098)
OnePager CUC * March 2019	-0.015 (0.014)	-0.017 (0.015)	-0.017 (0.015)	-0.016 (0.014)	-0.014* (0.0078)	-0.0018 (0.010)
OnePager * April 2019	-0.012 (0.014)	-0.011 (0.014)	-0.011 (0.014)	-0.0030 (0.013)	-0.010 (0.010)	0.00078 (0.011)
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OnePager * May 2019	0.0099 (0.017)	0.010 (0.017)	0.010 (0.017)	0.0023 (0.015)	-0.0030 (0.014)	0.027** (0.014)
OnePager CUC * May 2019	-0.014 (0.017)	-0.018 (0.017)	-0.018 (0.017)	-0.021 (0.015)	-0.013 (0.014)	0.0041 (0.012)
OnePager * After June 2019	0.0028 (0.017)	0.0035 (0.016)	0.0035 (0.016)	-0.0015 (0.011)	0.0012 (0.0066)	0.0044 (0.013)
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What is the impact on citizens?

- **Data:**

- ▶ Daily courts records
- ▶ High court opinions
- ▶ Court satisfaction surveys
- ▶ Kenyan Continuous Household Survey

- **Results:** Information and accountability causes

- ▶ reduction in adjournments
- ▶ firms in contract intensive industries wrote more contracts
- ▶ wage growth in contract intensive industries
- ▶ increase in structural transformation

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Measuring Quality

- Compile database of all 159,645 written decisions in Kenya's publicly available search engine for higher courts (1976-2020)
- Extract proxies for quality
 - ▶ Length of the judgement
 - ▶ Number of laws or cases cited
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Measuring Quality

- Court User Satisfaction Surveys (CUSS, 2015-2019) collected by the Kenyan judiciary
 - ▶ Satisfaction with multiple aspects of court processes

Speed of Justice & Quality

No adverse impacts on usual proxies for quality

	Judgement Length	Cases in text	Laws in text	Number citations
OnePager * February 2019	-2.75 (160.75)	-0.87 (0.66)	0.23 (0.55)	-0.01 (0.09)
OnePager CUC * February 2019	-38.67 (179.62)	-0.07 (0.82)	0.06 (0.54)	-0.10 (0.10)
OnePager * March 2019	194.00 (142.12)	0.09 (0.38)	0.32 (0.50)	0.05 (0.05)
OnePager CUC * March 2019	107.30 (179.59)	0.54 (0.52)	0.67 (0.60)	0.22 (0.25)
OnePager * April 2019	186.91 (193.18)	0.73 (0.68)	0.56 (0.73)	0.13* (0.07)
OnePager CUC * April 2019	-29.20 (229.49)	0.89 (0.60)	0.49 (0.82)	-0.07 (0.09)
OnePager * May 2019	-4.81 (221.05)	-0.76 (0.67)	0.51 (0.69)	0.08 (0.07)
OnePager CUC * May 2019	-92.43 (236.63)	0.17 (0.78)	0.86 (0.80)	-0.11 (0.09)
OnePager * After June 2019	143.04 (151.46)	-0.04 (0.75)	0.36 (0.69)	0.08 (0.07)
OnePager CUC * After June 2019	70.80 (194.39)	0.82 (0.87)	0.07 (0.66)	-0.05 (0.09)
OnePager * Month Before	-4.36 (172.62)	0.24 (0.45)	-0.26 (0.72)	0.08 (0.07)
OnePager CUC * Month Before	206.14 (194.22)	1.45** (0.61)	0.35 (0.68)	0.14 (0.14)
Observations	137,376	137,376	137,376	137,231
R-squared	0.111	0.141	0.126	0.034
Mean Dep Var	2023	3.273	5.128	1.350
(SD)	2643	6.558	13.51	12.82

Speed of Justice & Quality

No adverse impacts on usual proxies for quality

	Appeal	Convicted	Frivolous
OnePager * February 2019	0.027 (0.024)	0.047 (0.031)	0.0026 (0.0067)
OnePager CUC * February 2019	-0.011 (0.024)	0.011 (0.0088)	-0.0019 (0.0057)
OnePager * March 2019	0.047 (0.029)	0.027** (0.013)	0.0020 (0.0034)
OnePager CUC * March 2019	-0.0095 (0.037)	0.017 (0.012)	-0.0015 (0.0051)
OnePager * April 2019	0.066 (0.051)	0.0079 (0.011)	-0.0045 (0.0040)
OnePager CUC * April 2019	-0.00031 (0.031)	0.020 (0.014)	-0.0036 (0.0079)
OnePager * May 2019	0.011 (0.037)	0.015 (0.013)	-0.0023 (0.0037)
OnePager CUC * May 2019	-0.021 (0.033)	0.016 (0.011)	0.0053 (0.0073)
OnePager * After June 2019	0.016 (0.048)	0.015* (0.0076)	-0.0018 (0.0041)
OnePager CUC * After June 2019	0.042 (0.039)	0.0064 (0.010)	-0.0098 (0.0061)
OnePager * Month Before	0.017 (0.036)	0.0037 (0.012)	-0.0022 (0.0051)
OnePager CUC * Month Before	-0.00094 (0.037)	0.0061 (0.011)	-0.0087 (0.0059)
Observations	1321777	9047041	9047041

Speed of Justice & Citizen Satisfaction

What suggestions do you have for improving court facilities and services?

	Judge neutral	Judge led proceedings well	Suggestion Speed	Suggestion Quality
OnePager * 2019	0.04 (0.07)	0.00 (0.07)	-0.06* (0.03)	-0.06*** (0.02)
OnePager_CUC * 2019	-0.09 (0.07)	-0.04 (0.06)	-0.04 (0.04)	-0.05*** (0.02)
OnePager * 2015	0.29 (0.27)	0.33 (0.32)	-0.05 (0.03)	0.01 (0.04)
OnePager_CUC * 2015	0.26 (0.26)	0.31 (0.30)	-0.00 (0.03)	0.02 (0.04)
Observations	12,612	13,847	15,199	15,199
R-squared	0.875	0.903	0.227	0.176

We find a reduction in complaints about speed and quality.

No effects on complaints about court infrastructure, the court cells, the customer care desk, the court service delivery charter, or the court registry

One-Pagers did not change any of those factors

Speed of Justice & Citizen Satisfaction

What suggestions do you have for improving court facilities and services?

	Judge neutral	Judge led proceedings well	Suggestion Speed	Suggestion Quality
OnePager * 2019	0.04 (0.07)	0.00 (0.07)	-0.06* (0.03)	-0.06*** (0.02)
OnePager_CUC * 2019	-0.09 (0.07)	-0.04 (0.06)	-0.04 (0.04)	-0.05*** (0.02)
OnePager * 2015	0.29 (0.27)	0.33 (0.32)	-0.05 (0.03)	0.01 (0.04)
OnePager_CUC * 2015	0.26 (0.26)	0.31 (0.30)	-0.00 (0.03)	0.02 (0.04)
Observations	12,612	13,847	15,199	15,199
R-squared	0.875	0.903	0.227	0.176

We find a reduction in complaints about speed and quality.

No effects on complaints about court infrastructure, the court cells, the customer care desk, the court service delivery charter, or the court registry

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Effects on Economic Outcomes

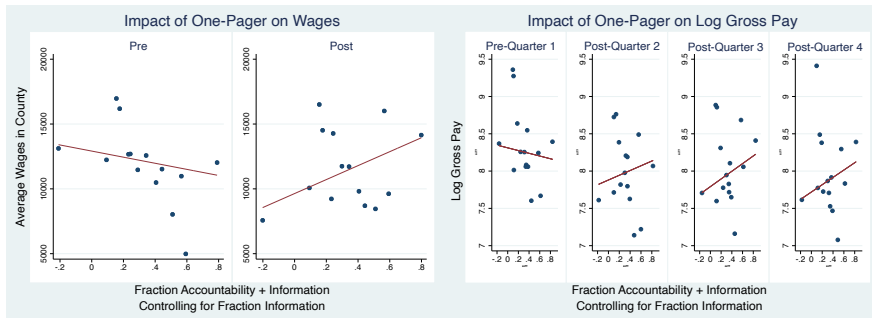
- Kenya Continuous Household Survey Programme (KCHSP)
 - ▶ implemented by the Kenyan National Bureau of Statistics (KNBS)
 - ▶ representative sample of Kenya
 - ▶ standard labor market outcomes (wages, labor contract, tenure)
- industry in which the individual is working (using the International Standard Industrial Classification)

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Speed of Justice & Economic Outcomes

Kenya Continuous Household Survey measures wages, industry, contracts



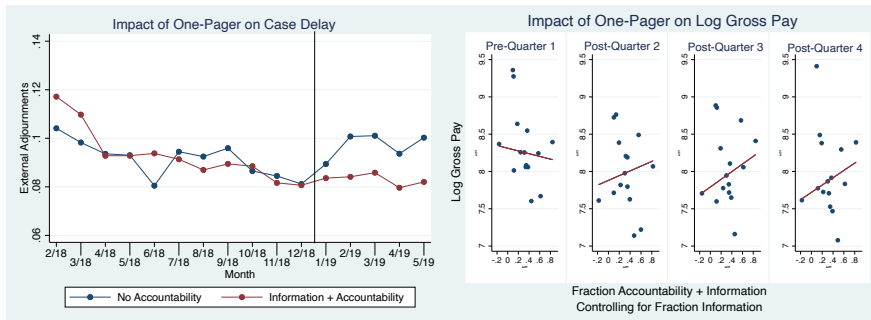
Wages of individuals in the county is associated with proportion of treated court stations in a county

Effects on Economic Outcomes

	Wage	Wage	Wage	Above Median CI	Below Median CI
Frac. OnePager * Post * CI			61.61 (46.95)		
Frac. OnePagerCUC * Post * CI			76.18** (34.96)		
Frac. OnePager * Post	58.50 (36.98)		52.40 (36.93)	93.36 (67.34)	39.02 (40.60)
Frac. OnePagerCUC * Post	98.37** (41.77)		106.88** (44.29)	177.71** (81.57)	66.28 (48.04)
Frac. OnePager * Quarter 2		61.67 (45.16)			
Frac. OnePagerCUC * Quarter 2		73.25 (48.16)			
Frac. OnePager * Quarter 3		71.74** (34.70)			
Frac. OnePagerCUC * Quarter 3		139.61*** (43.15)			
Frac. OnePager * Quarter 4		35.97 (46.34)			
Frac. OnePagerCUC * Quarter 4		82.97 (51.31)			
Observations	7,457	7,457	6,857	2,189	4,668
County fixed effects	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES
CI	NO	NO	YES	NO	NO
Mean control group	261	261	261	261	261
SD control group	319.3	319.3	319.3	319.3	319.3

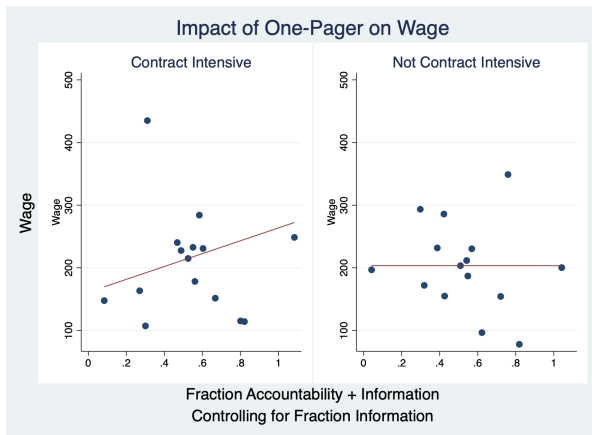
Average impact on wages to be 98.4 over a mean of 261. This translates to a 37% increase in wages (21% of the population report wages). The overall effect is 8% income per capita.

Speed of Justice & Economic Outcomes



Immediate wage effect is consistent with expectations mechanism.

Contract Intensity



The effects are larger in industries that are contract-intensive (i.e., complex input mix and reliance on contract enforcement)

Contract Intensity

Moving an individual from an industry at the average to the top 5 percent in terms of contract intensity is associated with a treatment effect of 23 percent increase in their wages

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CI	NO	NO	YES	NO	NO
Mean control group	261	261	261	261	261
SD control group	319.3	319.3	319.3	319.3	319.3

Contract Intensity: Other Measures

	Wage			
Frac. OnePager * Post * CI	61.61 (46.95)			
Frac. OnePagerCUC * Post * CI	76.18** (34.96)			
Frac. OnePager * Post	52.40 (36.93)	56.18 (63.25)	24.64 (41.85)	27.78 (46.97)
Frac. OnePagerCUC * Post	106.88** (44.29)	94.39 (60.38)	34.66 (47.52)	31.84 (46.14)
Frac. OnePager * Post * CI BEA		-2.95 (18.46)		
Frac. OnePagerCUC * Post * CI BEA		42.79* (21.42)		
Frac. OnePager * Post * CI WBES			-13.43 (23.41)	
Frac. OnePagerCUC * Post * CI WBES			60.93** (28.42)	
Frac. OnePager * Post * CI I/O WBES				-14.52 (50.64)
Frac. OnePagerCUC * Post * CI I/O WBES				73.08** (32.69)
Observations	6,857	3,513	2,582	2,582
County fixed effects	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES
Contract-Intensity	YES	YES	YES	YES
Mean control group	261	261	261	261
SD control group	319.3	319.3	319.3	319.3

Contract Intensity: Controls

Robust to tenure, gender, age, education, household size, etc.

Frac. OnePager * Post	52.40 (36.93)	55.68 (37.08)	51.48 (36.48)	49.15 (36.92)	44.28 (34.72)	53.21 (36.86)	40.49 (33.94)
Frac. OnePagerCUC * Post	106.88** (44.29)	116.87** (46.98)	105.97** (43.91)	103.53** (44.18)	88.72** (43.25)	105.30** (44.76)	90.07* (45.20)
Frac. OnePager * Post * CI	61.61 (46.95)	42.00 (38.05)	61.40 (47.29)	59.61 (46.62)	51.83 (38.37)	61.82 (46.31)	34.73 (31.30)
Frac. OnePagerCUC * Post * CI	76.18** (34.96)	78.78** (34.96)	76.35** (34.76)	75.23** (35.29)	68.35** (29.78)	75.94** (34.61)	69.54** (29.98)
Observations	6,857	6,651	6,857	6,857	6,857	6,857	6,651
County fixed effects	YES	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES	YES
CI	YES	YES	YES	YES	YES	YES	YES
Mean control group	261	261	261	261	261	261	261
SD control group	319.3	319.3	319.3	319.3	319.3	319.3	319.3
Tenure	YES						YES
Gender	YES						YES
Age	YES						YES
Education	YES						YES
HH size	YES						YES

Increase in Formal Contracts

Robust to different trimming of the wages, or using the log of wages, or using other measures of wage

	Wage	Wage Trim 3 sd	Log Wage	Total Gross Pay	Extensive Margin Wages	Written Contract
Frac. OnePager * Post * CI	61.61 (46.95)	63.25 (45.94)	0.37 (0.32)	59.99 (59.51)	0.022 (0.033)	0.06** (0.03)
Frac. OnePagerCUC * Post * CI	76.18** (34.96)	74.91** (35.45)	0.33* (0.18)	110.21* (57.14)	0.005 (0.026)	0.06** (0.03)
Frac. OnePager * Post	52.40 (36.93)	45.80 (37.56)	0.26 (0.35)	69.39 (64.07)	0.016 (0.037)	0.02 (0.02)
Frac. OnePagerCUC * Post	106.88** (44.29)	103.29** (44.23)	0.55 (0.35)	173.95** (67.44)	-0.008 (0.029)	0.04 (0.02)
Observations	6,857	6,827	6,857	3,574	34,887	34,154
County fixed effects	YES	YES	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES	YES	YES
CI	YES	YES	YES	YES	YES	YES
Mean control group	261	261	8.225	436.4	0.0921	0.143
SD control group	319.3	319.3	1.819	462.4	0.289	0.350

Individuals in the KCHSP are asked whether their labor contract is a written contract, a verbal agreement, an implied contract, or not a contract. We find **more written contracts** after the reform, which is indicative of citizens feeling more confident writing contracts.

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Increase in Formal Contracts

VARIABLES	Wage	Wage	Contract
Frac. OnePager * Post	58.50 (36.98)	39.47 (31.45)	0.03 (0.02)
Frac. OnePagerCUC * Post	98.37** (41.77)	66.58** (31.99)	0.04* (0.02)
Contract		332.96*** (12.48)	
Constant	357.06*** (8.14)	203.45*** (8.78)	0.36*** (0.00)
Observations	7,457	7,283	35,078
R-squared	0.065	0.324	0.045
County fixed effects	YES	YES	YES
Quarter FE	YES	YES	YES

17% of the increase in wages may be attributable to written contracts

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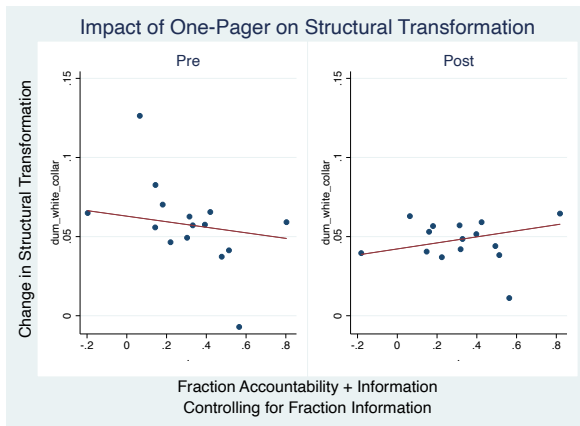
Occupation

A slight increase in non-farm activities, in “white collar” occupations compared to “blue collar” occupations, a slight increase in months worked.

	Non-farm	White Col.	White vs Blue	Months worked
OnePager * Quarter 2	0.05 (0.06)	0.01 (0.01)	0.05 (0.04)	-0.06 (0.25)
OnePager_CUC * Quarter 2	0.10* (0.06)	0.03** (0.01)	0.11* (0.06)	0.43 (0.25)
OnePager * Quarter 3	0.03 (0.08)	0.02** (0.01)	0.13*** (0.05)	-0.04 (0.32)
OnePagerCUC * Quarter 3	0.03 (0.06)	0.04*** (0.01)	0.18*** (0.06)	0.45 (0.28)
OnePager * Quarter 4	-0.05 (0.07)	0.01 (0.01)	0.09* (0.05)	0.22 (0.39)
OnePagerCUC * Quarter 4	0.07 (0.05)	0.04*** (0.01)	0.19*** (0.06)	0.73* (0.37)
Observations	34,894	86,647	15,878	19,947
County fixed effects	YES	YES	YES	YES
Quarter FE	YES	YES	YES	YES
Mean control group	0.398	0.0569	0.326	9.431
SD control group	0.490	0.232	0.469	3.152

Overall, these results paint a picture of a growing formal sector, in line with a structural change.

Speed of Justice Impacts Share of White Collar Jobs

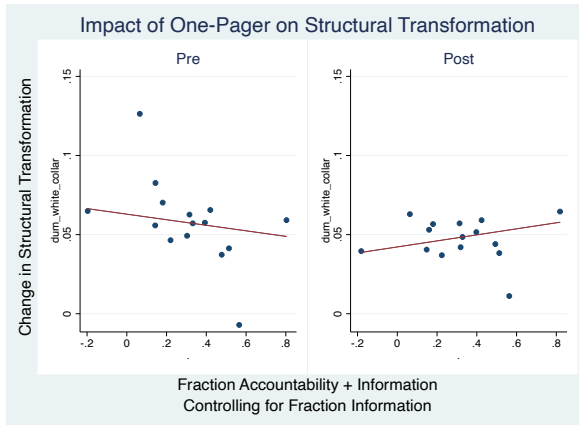


7% in “white collar” occupations

34% work in white collar as opposed to blue collar activities

14% have a written contract

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Other Results

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 - ▶ (1) data science can be used to identify the sources of delay and generate actionable recommendations
 - ▶ (2) overcoming information frictions (with nudges)
 - ▶ (3) but accountability is key, not just information
 - ★ top down & bottom up
- 3 pp reduction in adjournments
 - ▶ 20% reduction
 - ▶ Bigger effect on external adjournments (potentially frivolous)
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Impact of Free Legal Search on Rule of Law: Evidence from Indian Kanoon

Can digital platforms offering free legal information improve justice systems?

- Indian Kanoon launched in 2008
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- Indian Kanoon launched in 2008
 - ▶ Free access
 - ▶ Easy searches for laws and decisions of higher judiciary
- We estimate the impact of Indian Kanoon on cases, courts and firms
 - ▶ Event-study framework that exploits the staggered rollout across states
 - ▶ Data: we scraped and coded all cases on Kanoon (1858-2020), eCourts (1979-2018), AIR (2000-2020)
 - ▶ Linked to Prowess firms database (1979-2020)
- Impacts:
 - ▶ 1--2% increased likelihood of case resolutions in the years after launch
 - ▶ 20-50% decline in case backlog in the years after the launch
 - ▶ Lower court appeals 50% more likely to be overturned
 - ▶ Favorable effects on firm assets, declines in audit fees and bad debts

Event: Kanoon rolled out in stages

"bring knowledge of the law to the common people"

Keyword searches for automatic determination of most relevant clauses and judgments

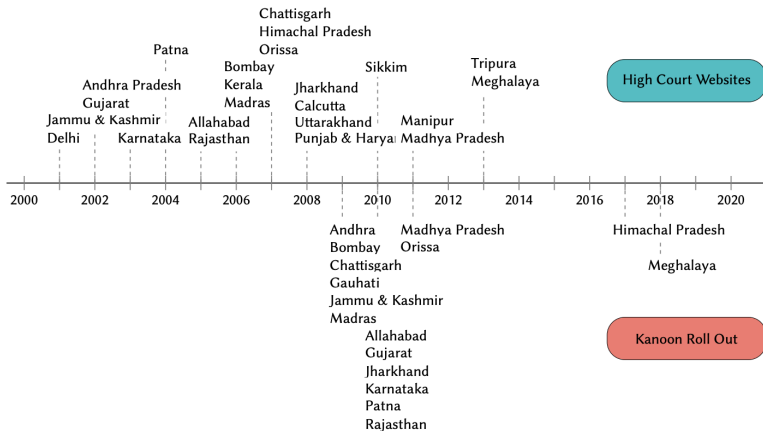


Figure: Roll Out Years for High Court Websites (top) and Kanoon (bottom)

Today, it is a "first-stop" for lawyers, 6 min per page, 2.9 M search queries and 1.5 M sessions per month

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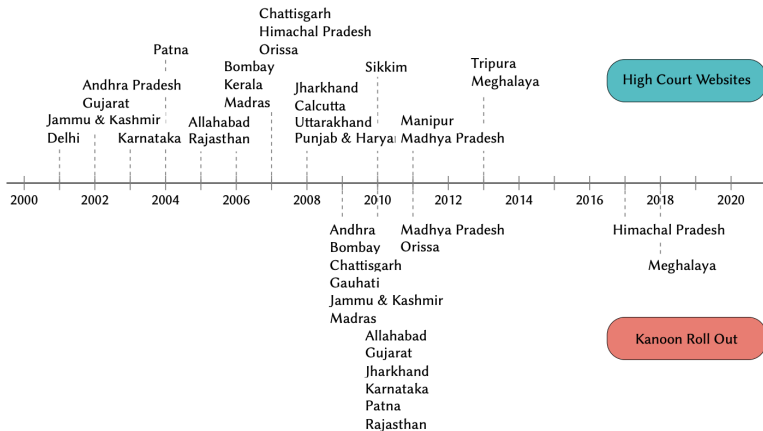
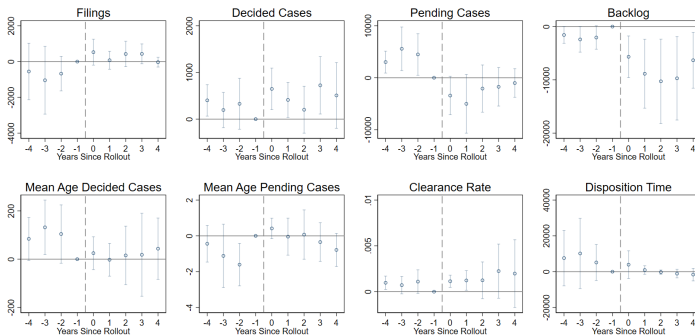


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Aggregate Efficiency Measures of High Courts

$$Y_{ct} = \alpha + \sum_{j=2}^4 \beta_j (lag_j)_{st} + \sum_{k=1}^4 \gamma_k (lead_k)_{ct} + \mu_c + \lambda_t + \epsilon_{ct} \text{ (Sun and Abraham 2021)}$$



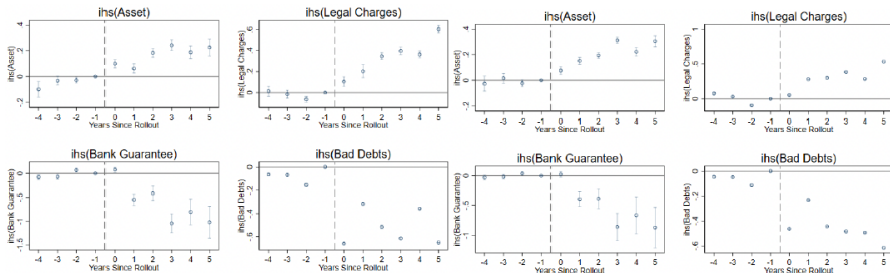
Pending cases decline by 17% and backlog by 43%. Impacts on efficiency driven by first years after rollout, suggestive of straightforward cases being resolved more quickly.

Event study analysis of firm financials

$$Y_{cfst} = \alpha + \sum_{j=2}^4 \beta_j (lag_j)_{cfst} + \sum_{k=1}^4 \gamma_k (lead_k)_{cfst} + \mu_s + \delta_f + \lambda_t + \epsilon_{cfst}$$

Firms with at least one case

General equilibrium



Sizeable impacts on assets and reduction of bad debt reinforce the findings of a 12% increase in employment in an RCT of free legal information to South African firms. (Bertrand and Crepon 2021)

Elevated rate of overturning cases suggestive of firms' (vs. judges') access to precedent

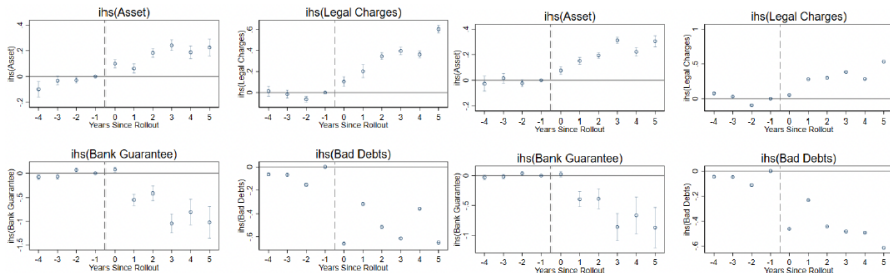
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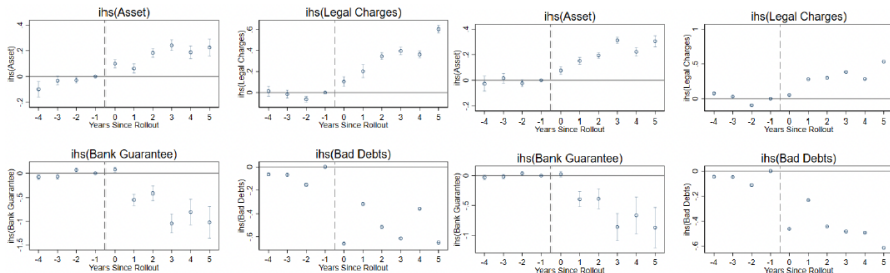
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Training Effective Altruism

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Prosociality affects a wide range of decisions—public goods provision, contract enforcement, management of commons, government efficiency

(Knack and Keefer 1997; La Porta et al. 1997; Fehr and Gächter 2002; Ostrom et al. 2002; Henrich et al. 2004; Guiso, Sapienza, and Zingales 2009; Cooper and Kagel 2015; Burks et al. 2016)

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What are scaleable best practices?

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selection

incentives

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soft skills (Deming 2017)

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1) prosocial behavior in lab and field

0.4-0.6 SD = effects of year-long mentoring program (Falk et al. 2018)

2) blood donations, only when blood type is told

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3) coordination, cooperation, honesty, teamwork, and theory of mind

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4) orphanage visit, empathy book, grades on soft skills, policy choices

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5) language of “we” social media

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Interpret results through self-image models (Benabou-Tirole 2011)

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- Select 1.5% of test-takers
 - ▶ 14,521 candidates => 213 qualified (Feb 2019)
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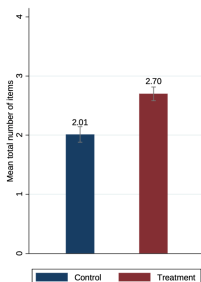
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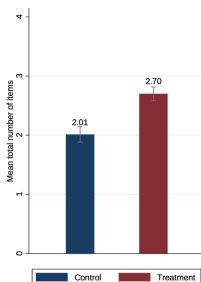
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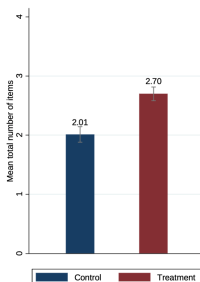
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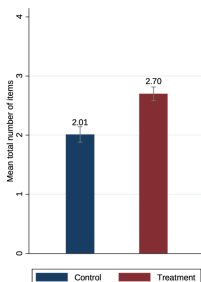
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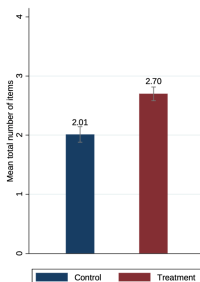
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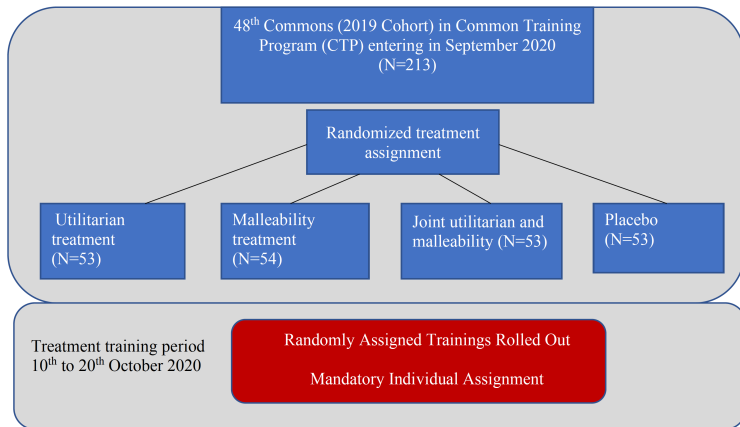
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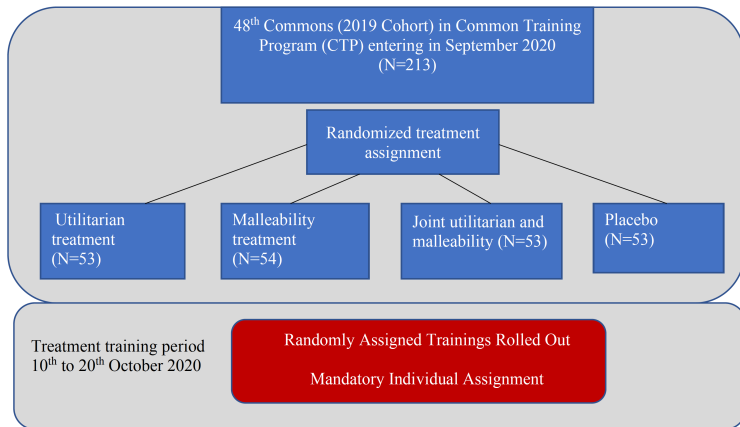


Utilitarian x Malleability x Both x Control (macroeconomics)

Four treatments via a non-shareable / non-downloadable link

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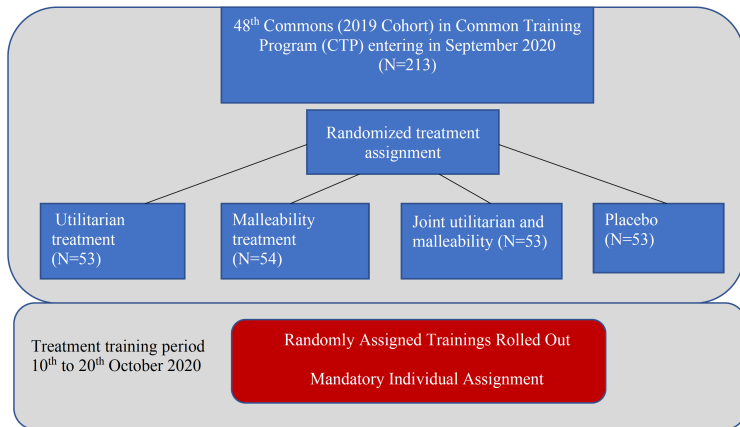


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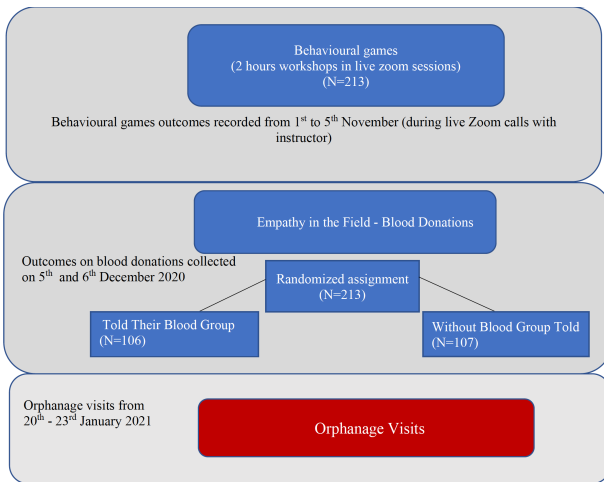


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Measurement of Outcomes

1-4 months later



Utilitarian

- What is empathy
- Puzzle: most profitable firms rank highly in empathy
 - ▶ Is cut throatiness not going to get you more profits?
 - ▶ Empathy can boost profit
 - ▶ Employees and employers with soft skills navigate complex relationships, satisfy client needs, and maintain employee trust and motivation
 - ▶ Every new hire is trained in a "Google Empathy Lab"
 - ▶ Employees put on virtual reality goggles and practice their perspective-taking or empathy
 - ▶ The employees are encouraged to take the perspective of homeless person and "see the world from the standpoint of the less fortunate"
 - ▶ So 21st century companies like Google may be investing in empathy to improve their profits.
- Qualitative and quantitative evidence backs the idea that empathy is beneficial.

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 - ▶ Narratives about public figures
 - ▶ Quantitative evidence from scientific articles

GROWTH MINDSET (Yeager et al. Nature 2019)

SELF-IMAGE (Benabou-Tirole 2004; 2006; 2011)

Malleability does not have an effect in this framework because behavior signals identity

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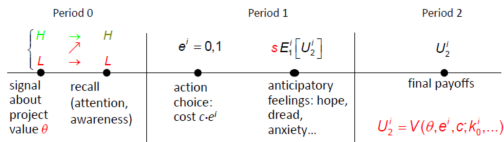
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Utilitarian and Malleability

A Simple Unifying Framework

2. Anticipatory feelings / self-esteem => motivated cognition (B&T 2011, B 2013)



$$U(a) = (v + y)a + \mu E(x | a)$$

v : prosocial identity

y : extrinsic payoff

μ : agents' weight on perceptions

$E(x | a)$: perception of prosocial identity

- Utilitarian training emphasized **private benefits** of empathy
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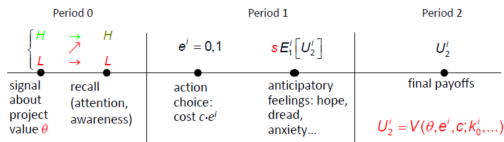
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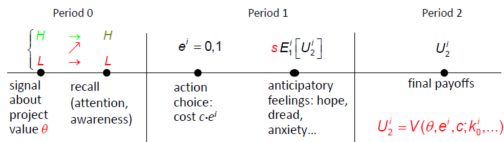
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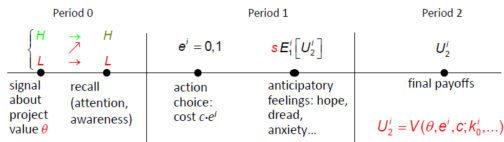
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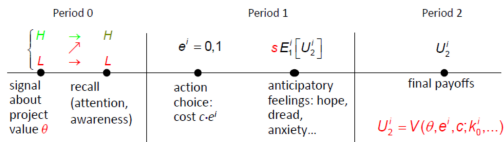
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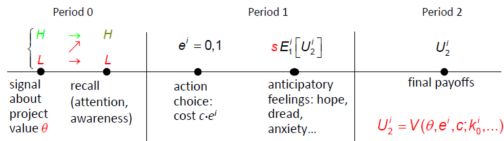
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- Sutter, Zoller, Glätzle-Rützler 2019
 - ▶ 11 behavioral games
 - ▶ Book choice
- Blood donations from prominent blood bank
 - ▶ volunteers made urgent truthful requests
 - ▶ **their** particular blood type vs. no explicit mention
 - ▶ unique COVID survey on blood type
 - ▶ “Blood is urgently needed at the blood bank”
 - ▶ “Blood for group O negative is urgently needed at the blood bank”
 - ★ altruist would respond to both
 - ★ effective altruist responds to latter
- Orphanage Visit
 - ▶ Syndicate field trip
 - ▶ Visit prominent orphanage (*Dar-ul-Aman*)
OR attend lecture/field site of senior bureaucrat

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Altruism

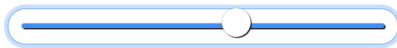
In this game, we allocate you 10 credits. Your task is to choose how many credits you want to keep for yourself and how many you want to give to another participant.

Please choose an option from the following distributions:

(Click on the axis below to position and move the cursor.)

You keep

4 credit (s)



You are giving

6 credit (s)

- “dictator” voluntarily send money without clear benefit (Kahneman et al. 1986)

Charity

In this game, we offer you to make 5 choices. Only one of these choices will be used to determine the credits received if you are drawn.

For each of the choices, you must choose between receiving the credits or donating the credits to UNICEF. If you are drawn, we will transfer your donation to UNICEF and purchase measles vaccines.

Measles is an extremely infectious disease that spreads very quickly in densely populated spaces. In vulnerable children, the disease is often fatal (more than 100,000 deaths per year worldwide), and can cause long-term physical or mental damage. UNICEF conducts major immunization campaigns, especially after natural disasters and other emergencies, to prevent the spread of the disease.

For each row, please choose one of the two options:

1) ☐ I receive 2 credits; no donation to UNICEF ☐ donation of 10 credits to UNICEF; no credits for me

2) ☐ I receive 4 credits; no donation to UNICEF ☐ donation of 10 credits to UNICEF; no credits for me

3) ☐ I receive 6 credits; no donation to UNICEF ☐ donation of 10 credits to UNICEF; no credits for me

4) ☐ I receive 8 credits; no donation to UNICEF ☐ donation of 10 credits to UNICEF; no credits for me

5) ☐ I receive 10 credits; no donation to UNICEF ☐ donation of 10 credits to UNICEF; no credits for me

“charity” game (Bettinger and Slonim 2006)

Cooperation

Decision on your part

You must decide how much of this initial endowment you wish to transfer to the other participant (between 0 and 1 credit). The transferred quantity will be doubled and the other participant will receive this doubled quantity. What you choose not to transfer remains in your possession but will not however be doubled.

Exemple de votre décision



Decision (simultaneous) from your partner

The other participant simultaneously makes the same decision. He decides how much of his initial endowment he wishes to transfer to you (between 0 and 1 credit). You will receive double this transferred amount.

Coordination

Each round, **each of you has** the choice between two options: A and B.

Your winnings are shown in the table below
(your winnings are in blue, your partner's in black)

		L'autre participant	
		Action A	Action B
Vous	Action A	3 crédits, 3 crédits	3 crédits, 0 crédits
	Action B	0 crédits, 3 crédits	5 crédits, 5 crédits

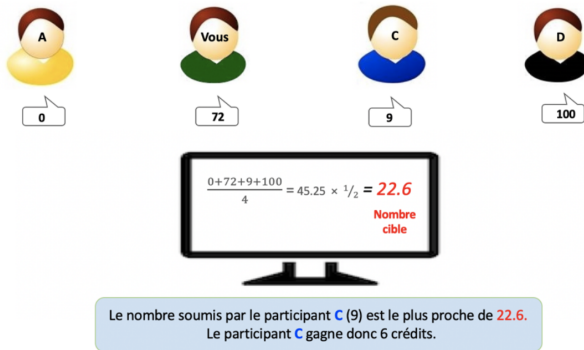
Theory of Mind

Each round, each party member submits a number between 0 and 100. Single digit decimal numbers are allowed.

The computer then calculates the average of the 4 proposed numbers, then multiplies this average by a half.

This gives a " **target number** " as illustrated below.

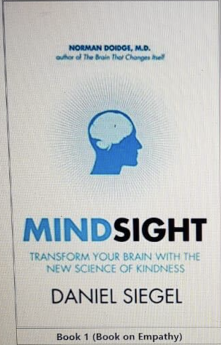
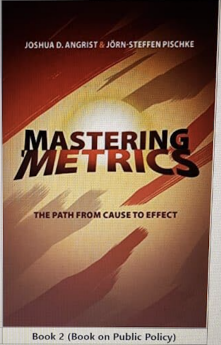
The member of the group whose proposed number is closest to the target number earns 6 credits.



“Guessing game” (Nagel 1995)

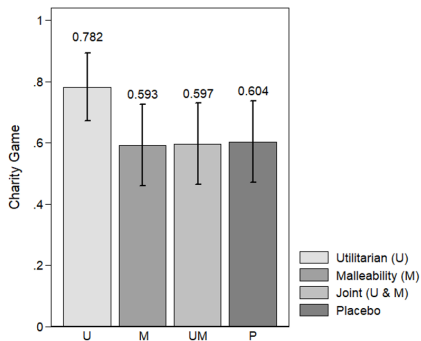
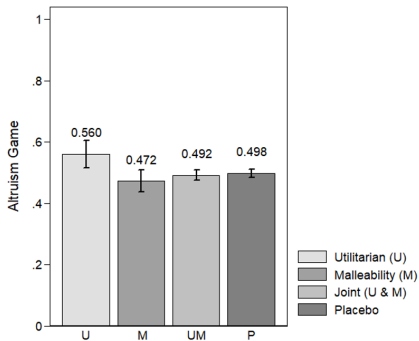
Book Choice (lottery)

As stated earlier in the session, you will receive a free book. Please tell us which book you prefer.

 Book 1 (Book on Empathy)	 Book 2 (Book on Public Policy)
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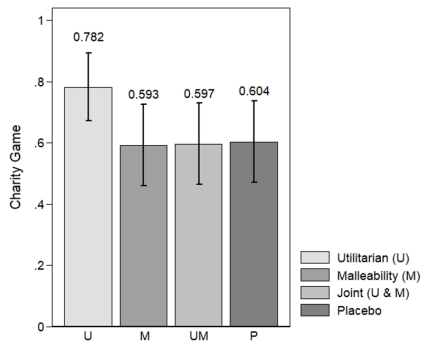
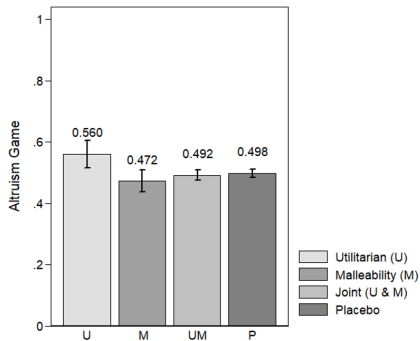
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Impact on Altruism & Charity



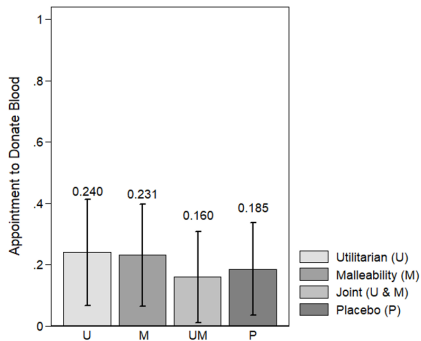
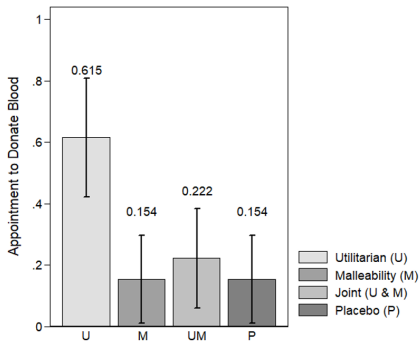
U ↑ 6 or 20 percentage points

Impact on Altruism & Charity



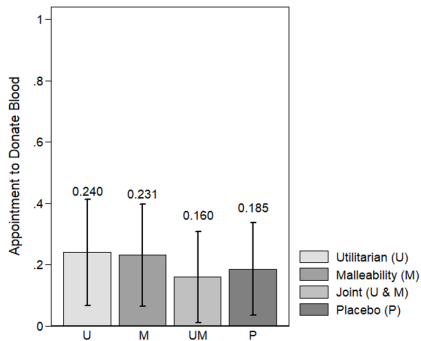
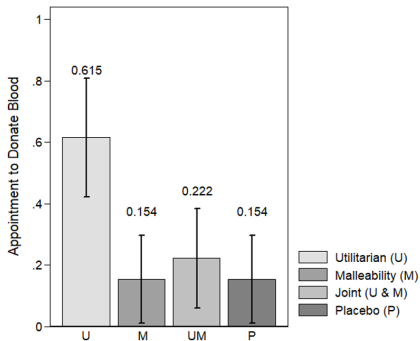
U ↑ 6 or 20 percentage points

Impact on Effective Altruism



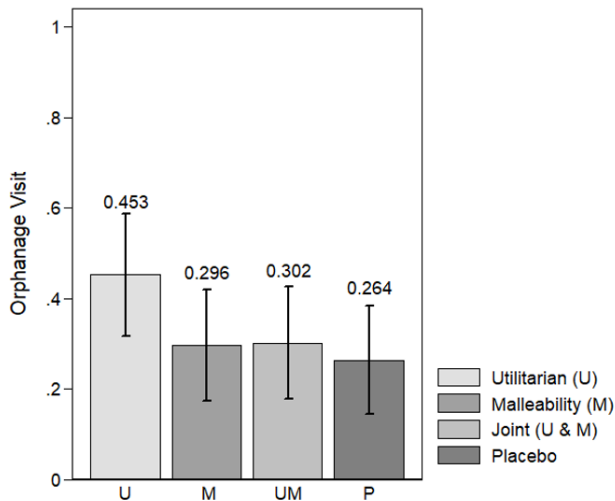
Only for matching blood type

Impact on Effective Altruism



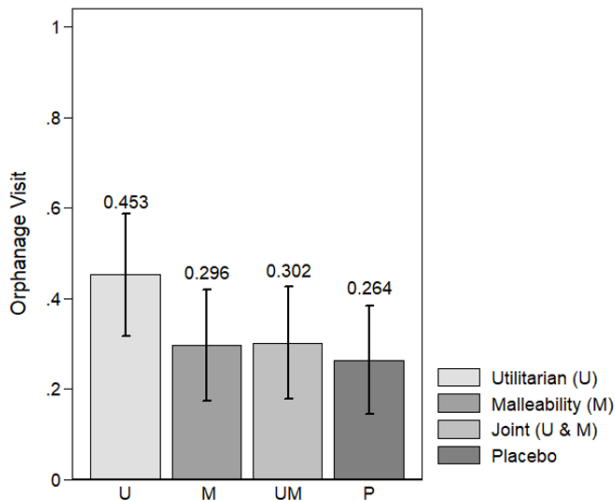
Only for matching blood type

Orphanage Visits



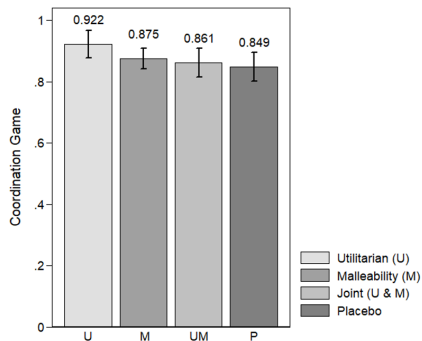
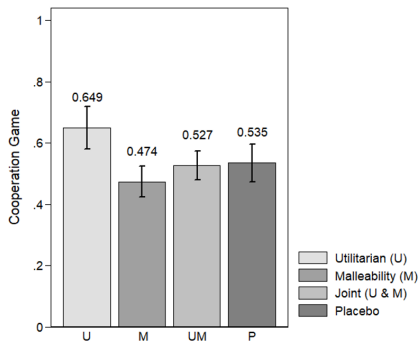
U ↑ 19 percentage points

Orphanage Visits



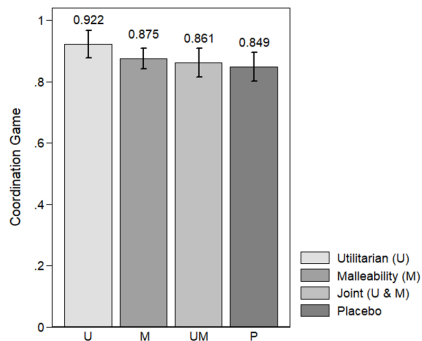
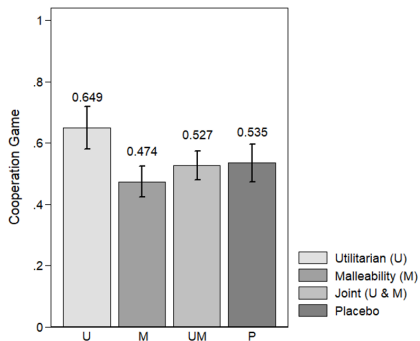
U $\uparrow$ 19 percentage points

Impact on Cooperation & Coordination



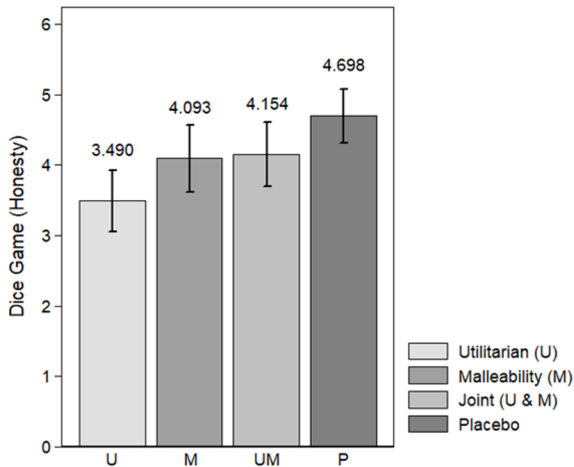
U ↑ 14 or 5 percentage points

Impact on Cooperation & Coordination



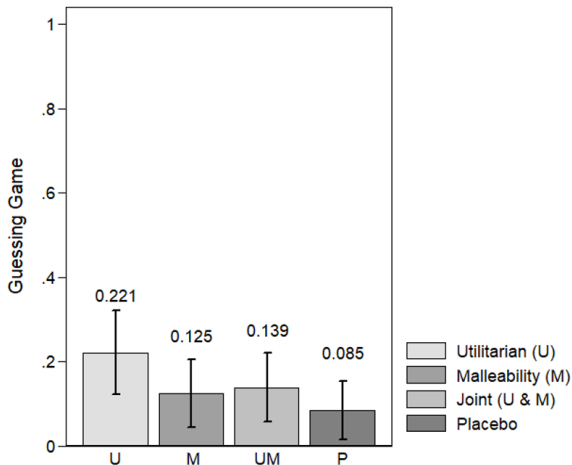
U ↑ 14 or 5 percentage points

Impact on Honesty



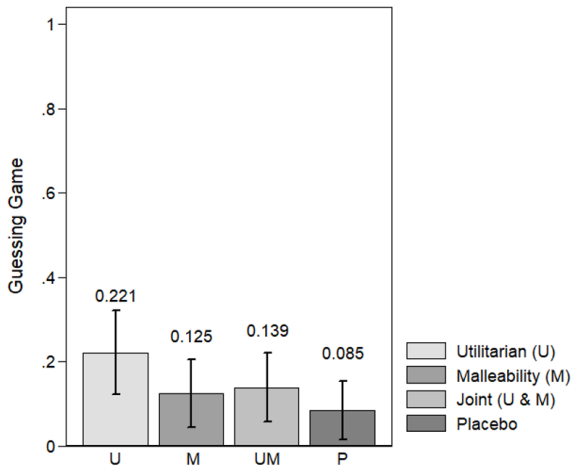
Each bar reports the average of self-reported die rolls

Impact on Theory of Mind



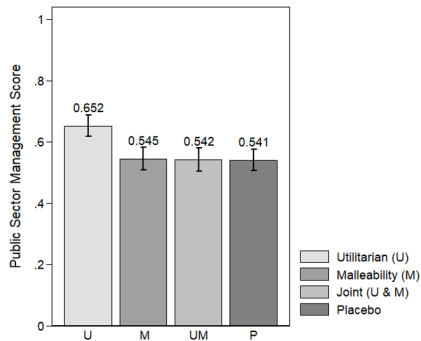
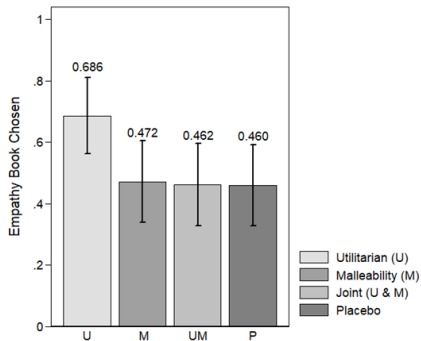
NOVEL EVIDENCE THAT THEORY OF MIND CAN BE IMPROVED WITH EMPATHY

Impact on Theory of Mind



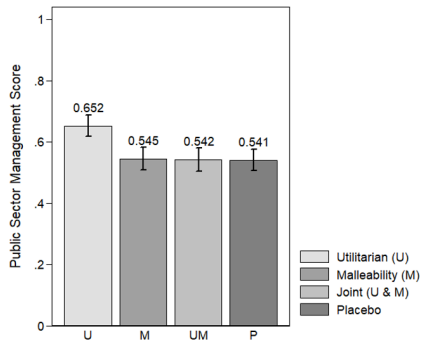
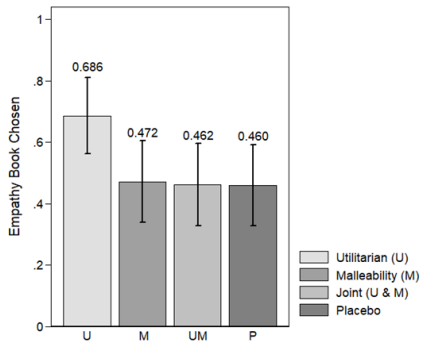
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Impact on Empathy Book Choice & Public Sector Management Grades



U ↑ 20 or 11 percentage points

Impact on Empathy Book Choice & Public Sector Management Grades



U $\uparrow$ 20 or 11 percentage points

Regressions

Table 6: Impact of Treatments on Policy

	<i>Orphanage Renovation Policy</i>		<i>School Renovation Policy</i>	
	Letter Sent	Funds Recommended (PKR)	Letter Sent	Funds Recommended (PKR)
	(1)	(2)	(3)	(4)
<i>U</i>	0.306*** (0.0754)	72,708** (30,867)	0.386*** (0.0892)	78,101** (30,181)
<i>M</i>	0.0599 (0.0562)	19,007 (25,173)	-0.0381 (0.0768)	17,764 (13,888)
<i>UM</i>	0.0939 (0.0597)	17,448 (24,144)	-0.0451 (0.0755)	25,848 (18,399)
Individual Controls	Yes	Yes	Yes	Yes
Observations	201	201	201	201
R-squared	0.197	0.125	0.253	0.147
Mean of dep. var. (placebo)	0.041	18367.35	0.163	8367.35

TRAINING SOFT SKILLS AFFECTED POLICY CHOICES AND FUNDING
RECOMMENDATIONS

Regressions

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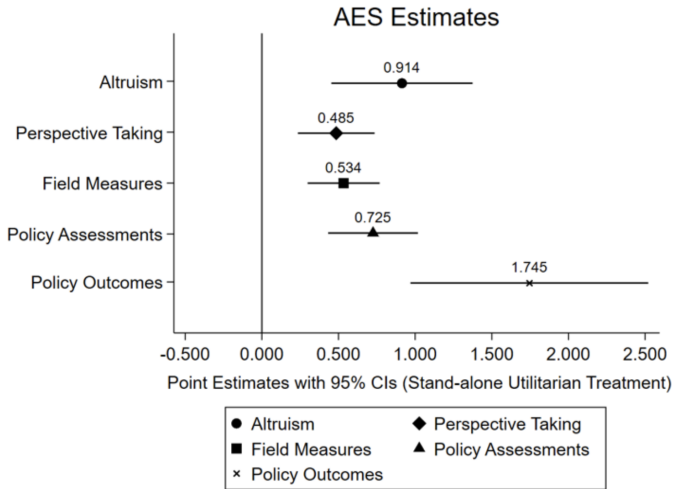
TRAINING SOFT SKILLS AFFECTED POLICY CHOICES AND FUNDING
RECOMMENDATIONS

Increased Demand for Learning About Empathy

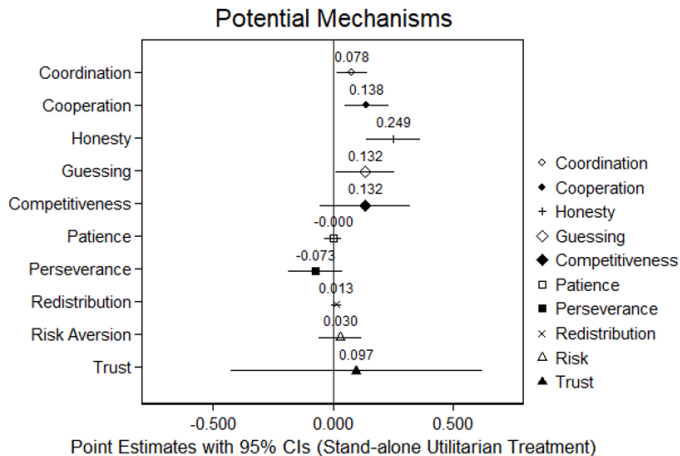
Table 9: Causal Mediation Analysis – Mechanism

	<i>Orphanage Renovation Policy</i>		<i>School Renovation Policy</i>	
	Letter Sent	Funds Recommended (PKR)	Letter Sent	Funds Recommended (PKR)
	(1)	(2)	(3)	(4)
<i>U</i>	-0.0703 (0.0610)	-31,895 (20,961)	-0.250* (0.136)	-3,443 (20,214)
<i>M</i>	0.208* (0.108)	71,262 (44,827)	-0.0659 (0.151)	41,749 (30,768)
<i>UM</i>	0.0284 (0.109)	24,604 (51,114)	-0.0430 (0.168)	60,145 (45,833)
<i>Empathy Book Assigned</i>	0.0169 (0.0534)	22,815 (21,408)	-0.317 (0.203)	-1,291 (34,365)
<i>UX Empathy Book Assigned</i>	0.458*** (0.138)	56,736 (40,251)	1.124*** (0.229)	119,067** (51,932)
<i>MX Empathy Book Assigned</i>	-0.318** (0.134)	-115,090** (47,621)	0.0983 (0.254)	-16,161 (45,536)
<i>UMX Empathy Book Assigned</i>	-0.133 (0.119)	-68,845 (45,727)	0.213 (0.233)	-21,556 (44,478)
Individual Controls	Yes	Yes	Yes	Yes
Observations	201	201	201	201
R-squared	0.328	0.204	0.429	0.196

Recap



Mechanisms



Robust to Multiple Hypothesis Tests

	Altruism Game	Charity Game	Cooperation Game	Coordination Game	Guessing Game	Competitive Game
	(1)	(2)	(3)	(4)	(5)	(6)
Stand-alone Utilitarian (U)	0.061	0.215	0.136	0.065	0.116	0.102
p-value	<u>(0.003)</u> ***	<u>(0.019)</u> **	<u>(0.005)</u> ***	<u>(0.059)</u> *	<u>(0.047)</u> **	(0.277)
Sharpened q -value	<u>[0.031]</u> **	<u>[0.09]</u> *	<u>[0.031]</u> **	[0.153]	[0.153]	[1.000]
Huber-White p -value	<u>{0.004}</u> ***	<u>{0.019}</u> **	<u>{0.005}</u> ***	<u>{0.059}</u> *	<u>{0.047}</u> **	{0.277}
Stand-alone Malleability (M)	-0.021	-0.013	-0.040	0.018	0.037	0.014
p-value	(0.254)	(0.892)	(0.323)	(0.568)	(0.505)	(0.880)
Sharpened q -value	[0.950]	[1.000]	[0.950]	[1.000]	[1.000]	[1.000]
Huber-White p -value	{0.254}	{0.892}	{0.324}	{0.568}	{0.505}	{0.880}
Joint Treatment (UM)	-0.018	-0.046	-0.009	0.010	0.038	0.058
p-value	(0.159)	(0.619)	(0.815)	(0.759)	(0.523)	(0.536)
Sharpened q -value	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]	[1.000]
Huber-White p -value	{0.159}	{0.619}	{0.815}	{0.759}	{0.523}	{0.536}

False Discovery Rate (FDR) q -values (Anderson et al., 2008)

Huber-White standard errors (Muralidharan et al. 2019)

Interpretation

- TRAINING HIGH-STAKE DECISION-MAKERS IN BENEFITS OF SOFT-SKILLS/SOCIAL SKILLS INCREASES THEIR SOFT-SKILLS/SOCIAL SKILLS
 - ▶ altruism, blood donations, cooperation, coordination
- EMPHASIZING UTILITY OF SOFT SKILLS FACILITATES THEIR PUTTING THEMSELVES IN ANOTHER SHOES (PERSPECTIVE-TAKING)
 - ▶ theory of mind, empathy choice, orphanage visit, soft skills grades
 - ▶ learning, not just priming
 - ▶ altruism, not just fairness
 - ▶ effective altruism, not just altruism

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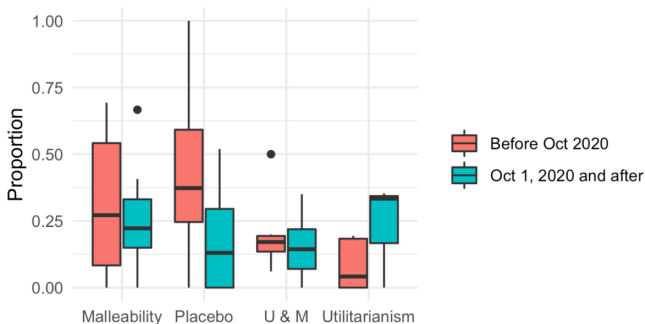
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Impact on Thought Leadership

Preliminary evidence in twitter feeds

Proportion We vs I

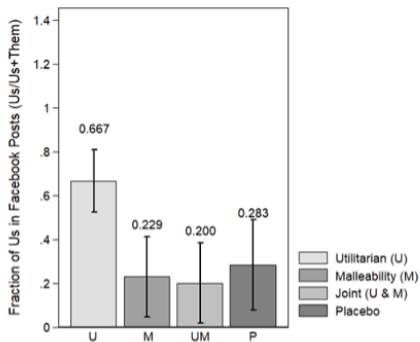
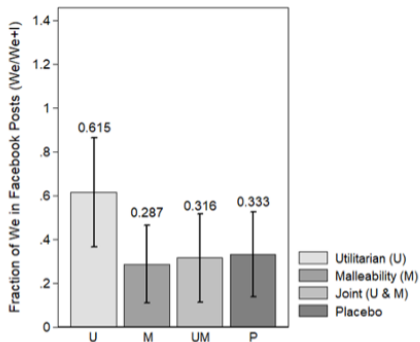
Using data from June 2020 onwards



increase % of "We" vs. "I"

Impact on Thought Leadership

Also seen in Facebook posts (“We” vs. “I”)



increase % of “us” vs. “them”

Looking ahead

- Impact on bureaucratic performance
 - ▶ Correlate behavioral games with behavior in field
- Impact on followers
 - ▶ Memes
 - ▶ Retweets
 - ▶ False news
 - ▶ (Does perspective taking increase truthiness)
 - ▶ Does it affect who they follow?
- Impact of learning causal inference

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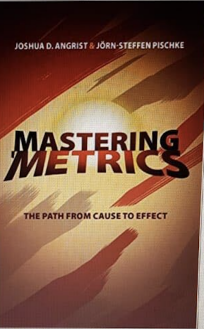
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Book choice (lottery)

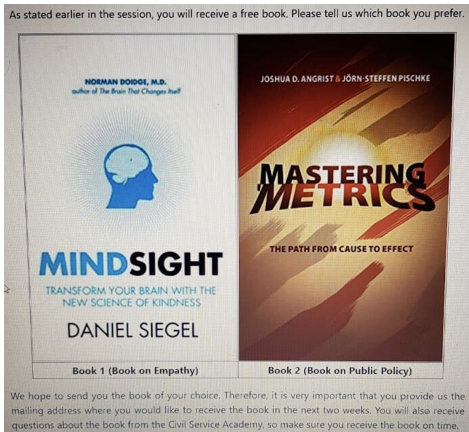
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NORMAN DOIDGE, M.D. <i>author of The Brain That Changes Itself</i>  MINDSIGHT TRANSFORM YOUR BRAIN WITH THE NEW SCIENCE OF KINDNESS DANIEL SIEGEL	JOSHUA D. ANGRIST & JÖRN-STEFFEN PISCHKE  MASTERING METRICS THE PATH FROM CAUSE TO EFFECT
Book 1 (Book on Empathy)	Book 2 (Book on Public Policy)

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- Graded 1500 word essay & 1500 word application to prospective career
- Sent links to videos produced by authors
 - ▶ Measure compliers **AND** defiers

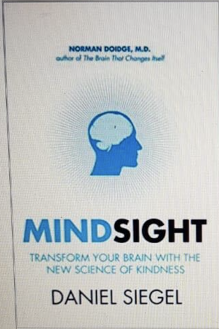
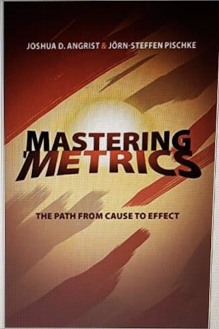
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Concluding remarks

- Utilitarian version of empathy training yielded
 - ▶ Similar effect size as year-long mentoring program (Kosse et al., 2020)
- Improves pro-social behavior
 - ▶ Altruism and charitable donations
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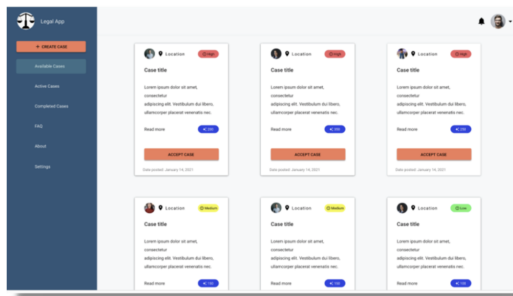
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Human-centric AI in justice

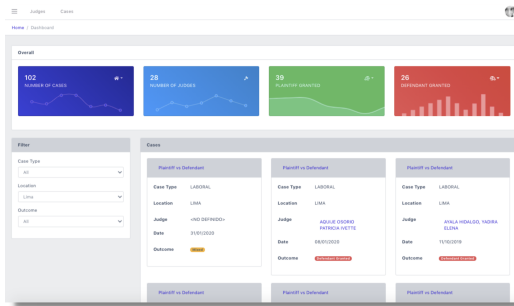


Reduces pendency of cases and increases the efficiency of courts by facilitating the optimal assignment of cases to judges in courts where there are backlog and delays

The App follows a similar model to Uber, where the “drivers” are judges and the “customers” are case administrators, or those who manage and assign cases

Instead of using “smart” assignments that do not incorporate judges’ own preferences and information about their own skills, human centric AI assumes that every agent/judge has private information and reacts to incentives. Given their information advantage, it is often better to let a judge make their own decisions. Importantly, carefully designed incentives can help shape a judge’s decision to optimize outcomes..

Personalized case-based teaching



Leverages the history of the judge's own written decisions to evaluate how such judge would decide on a similar case in comparison to a curricular example or to other similar decisions by peer judges

Brings case-based teaching to the next level, providing users with a personalized training that has the potential to improve the quality and efficiency of judicial training and judicial decisions

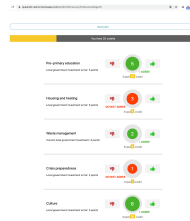
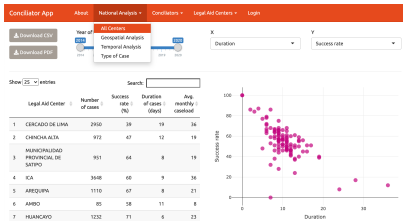
Help create culture of precedent

Building Capacity

Open source no-code tools for

Data entry and decision-support

Understanding justice needs



Learning best practices

Increasing recognition-respect

The form displays a login screen with a progress bar and a text input field for the third case type. Below the input field, there is a section for describing the strategy used or found most useful (50 words or fewer). A progress bar indicates the effectiveness of the strategy (70 is the most effective). The form includes a Submit button.

