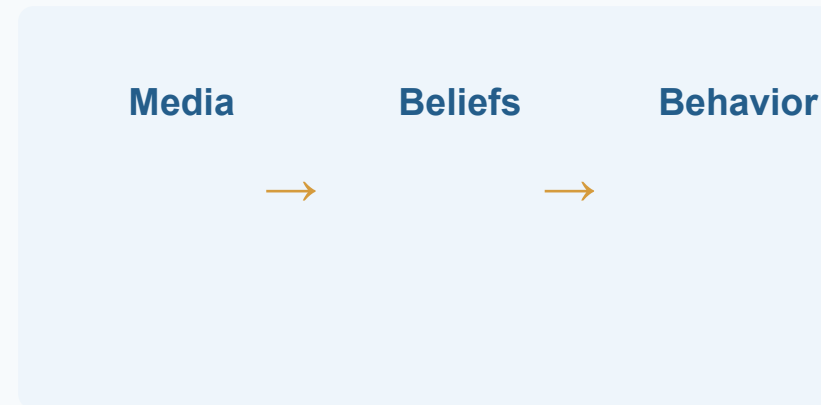


Information and Conflict

From the role of (social) media and public opinion to big data and forecasting



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ReCIPE Online Course — April 20, 2026

Covered in last year lecture: (Social) media and conflict

Information is a fundamental determinant of behavior in conflict environments because the stakes are high and uncertainty is pervasive.

Why information matters

- High stakes: drastic gains and losses from violence
- High uncertainty: beliefs and anticipation are crucial for all actors
- Media is the main information source for most of the population

Core mechanism

Information
→ beliefs
→ behavior
→ outcomes

1. Information and conflict measurement

Media and conflict event data

2. Information and the economic impact of violence

How information shapes behavioral responses of households and firms to violence

3. Information and conflict forecasting

Media, big data, and violence forecasting

Reading List

Information and disaggregated conflict event datasets

Weidmann, Nils B. “On the accuracy of media-based conflict event data.” *Journal of Conflict Resolution* 59.6 (2015): 1129–1149.

Information and the economic impact of conflict

Besley, T., and Mueller, H. (2012). “Estimating the Peace Dividend: The Impact of Violence on House Prices in Northern Ireland,” *American Economic Review*, 102: 810–33.

Besley, T., Fetzer, T., and Mueller, H. (2026). “How Big Is the Media Multiplier? Evidence from Dyadic News Data,” *Review of Economics and Statistics*, 1–45.

Tapsoba, A. (2023). “The Cost of Fear: Impact of Violence Risk on Child Health during Conflict,” *Journal of Development Economics*, 160: 102975.

Information and conflict forecasting

Mueller, H., and Rauh, C. (2018). “Reading between the Lines: Prediction of Political Violence Using Newspaper Text,” *American Political Science Review*, 112: 358–75.



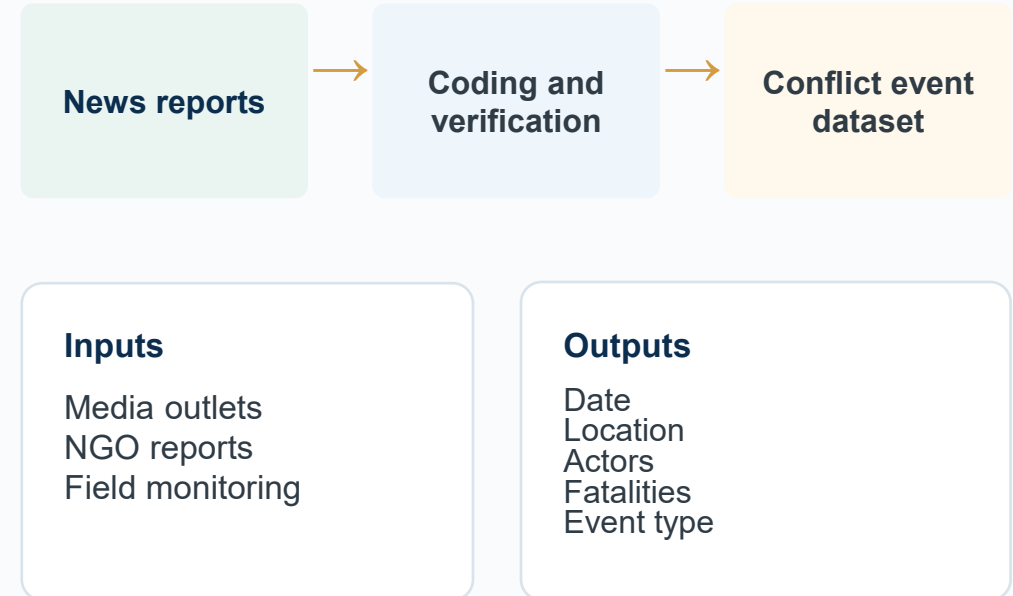
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Information and conflict measurement

From raw news reports to curated event datasets

Conflict Datasets: How Do We Measure Conflict Events?

- Modern research on conflict moved from cross-country studies using aggregate datasets to disaggregated conflict event datasets:
 - Datasets that contain information about individual incidents in a conflict.
- Virtually all conflict event datasets that allow for local studies of conflict dynamics rely on news reports on various media outlets (plus NGO reports).
- There is high demand for news covering violent events, and researchers have tapped into this market to create very detailed datasets of conflict events.
- Without news reports, it is difficult to know what is going on in many battlefields across the world.



Main Datasets

UCDP / GED — Uppsala Conflict Data Program

Coverage: Global, 1989–present

Unit: Georeferenced events with ≥ 1 direct death

Types: State-based, non-state, one-sided violence

Threshold: 25 deaths/year for a dyad to enter
Strength: High precision (day, location); peer-reviewed

ACLED — Armed Conflict Location & Event Data

Coverage: Africa (1997), then global

Types: Battles, riots, protests, civilian violence, explosions

Strength: More event types; real-time updates; no death threshold

Other conflict event datasets

GDELT: massive real-time automated coding of news reports, including radio broadcast content in several languages

Comparison: different questions may require different datasets.

ACLED: broader event types · UCDP/GED: organized violence with fatalities

How reliable are news-based conflict event datasets?

Why reporting issues arise

- News outlets cater to audience preferences or editorial guidelines
- Journalists often rely on secondary information
- Coverage can vary sharply across time and space

Weidmann (JCR, 2015)

- Uses leaked military records from Afghanistan (Wikileaks / SIGACTS) to evaluate the accuracy of information given in news reports.
- Focuses on hard facts: location, timing, and number of casualties.

Main lesson

- The paper uncovers coverage bias, reporting imprecision, measurement error, and their determinants.
- **But the overall quality of UCDP was fairly good.**

Curated Conflict Datasets: Key Event Taxonomy and Definitions

Event-level data

Record individual incidents: date, location, actors, fatalities, and event type.

Why it matters: Disaggregated data allow an in-depth micro-analysis that is tied to the incentives of actors.

State-based armed conflict

Non-state conflict

Violence against civilians

Territorial transfer

Strikes

Riots

Protests

Kidnapping / hijacking

Coups

Bombings

Why does Event Taxonomy Matter for Research?

One example: the logic behind why people engage in each form of violence, and how it relates to socioeconomic factors, may vary.

Paper spotlight

“The Economic Origins of Conflict in Africa” — E. McGuirk & M. Burke, *Journal of Political Economy*, 2020, 128(10), 3940–3997

Central puzzle: how do changing economic conditions shape the likelihood and type of conflict?

Two key dimensions of heterogeneity:

1. Conflict can take observationally distinguishable forms.
2. Agricultural prices generate opposing effects on income across producers and net consumers within the same country.

Factor conflict

Control of territory
Large-scale battles
between organized groups

Output conflict

Appropriation of goods
Looting, riots, violence
against civilians

Research payoff

These distinctions allow testing a clear set of theory-guided predictions that are hard to explain by alternative mechanisms.

McGuirk & Burke (2020): Theoretical Framework

MEASUREMENT

Players

- **Producers** (subnational polities controlling land rents) choose between farming or launching attacks to control territory ('factor conflict')
- **Consumers** (atomistic agents) choose between wage labor and soldiering
- Key assumption: **property rights imperfectly protected**

Intuition

- A **drop in prices** raises the incidence of battles by *reducing the opportunity cost of soldiering* (lost farming profits)
- Expected spoils of battle (control of territory) do not decline at the same rate
- Lower price persistence → lower opportunity cost relative to long-run territorial value

4 Predictions

- **P1:** ↑ local crop prices → ↓ **factor conflict** (*farming more profitable*)
- **P2:** ↑ consumer food prices → ↑ **factor conflict** (*soldiering wage premium rises*)
- **P3:** ↑ local crop prices → ↑ **output conflict** (*more to loot*)
- **P4:** ↑ consumer food prices → ↑ **output conflict** (*real wages fall*)

Example: Covid / Ukraine price shocks

Recent food price inflation → higher consumer prices → more output conflict? Theory: **yes**, and confirmed empirically.

Curated event datasets have different coverage: Donnay et al. (JCR, 2019)

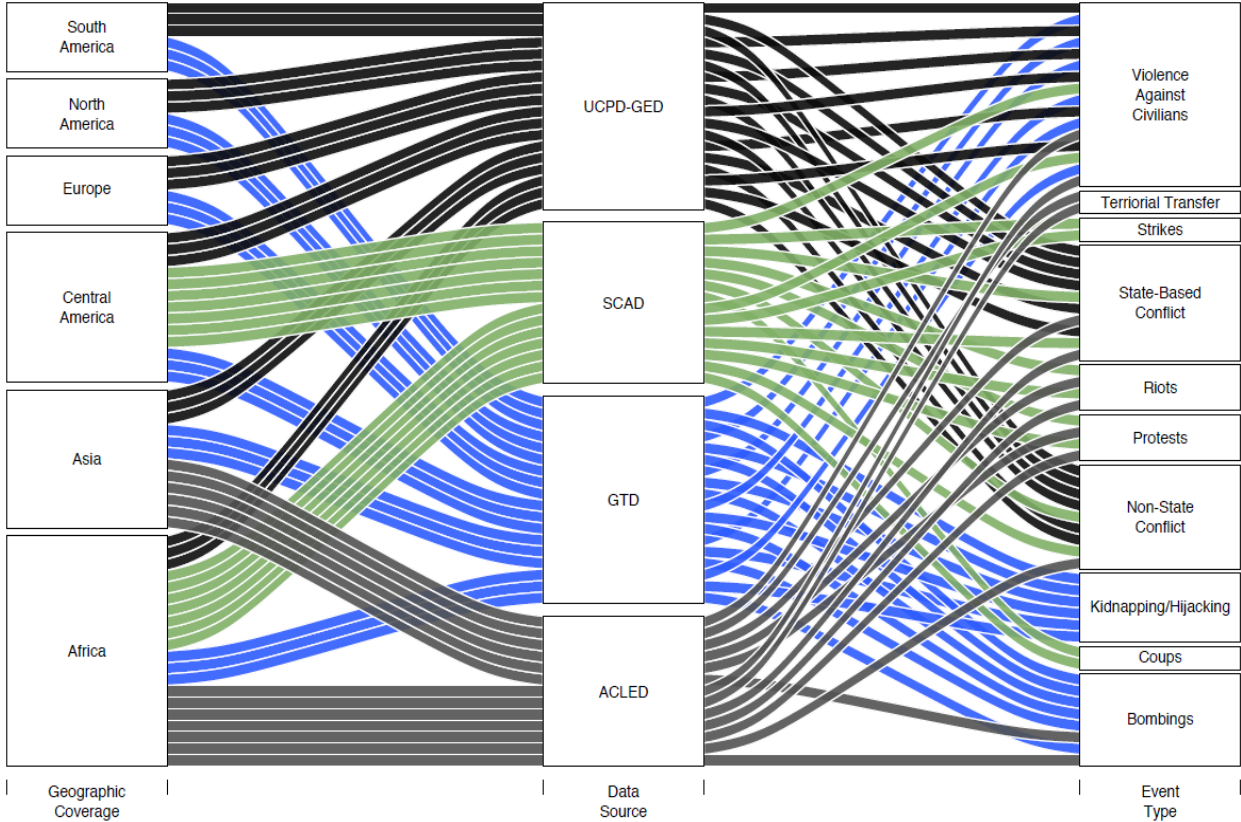


Figure 1. Geographic and Event Type Overlap Across Four Prominent Event Datasets

Event datasets can be harmonized

Paper

“MELTT: Matching Event Data by Location, Time and Type” — Donnay et al. (JCR, 2019)

Contribution

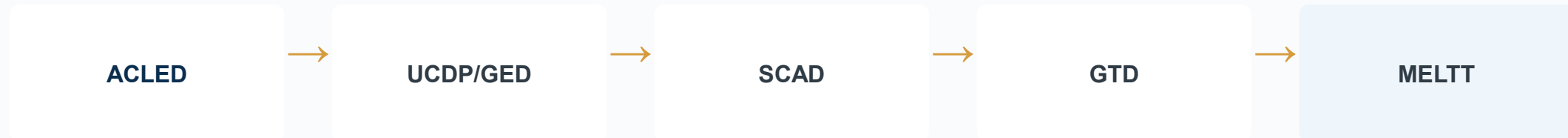
Introduces MELTT: Matching Event Data by Location, Time and Type.

Data

Merges ACLED, UCDP/GED, SCAD, and GTD into a harmonized format.

Value added

Provides more comprehensive measurement and permits coverage comparison.



Harmonizing several sources provides more comprehensive empirical measurement and allows the evaluation of relative coverage and data quality.

Harmonization improves both coverage and comparability



2.1

Information and the economic impact of violence on households

How information changes behavior even without direct exposure to violence

Two Reasons Why Information Shapes the Economic Impact of Conflict

Reason 1: Rational expectations and indirect impact

Information access → expectations over a latent violence process → fear → changed economic behavior → indirect cost.

Households can suffer adverse effects of violence before or even without direct exposure.

Examples: Tapsoba (2023) on conflict risk beyond incidence; Besley & Mueller (2012) on housing prices in Northern Ireland.

Reason 2: Heterogeneous information access

Differential media coverage → different beliefs → different economic decisions.

Literature focus on sporadic violent events with varying media attention: **mass shootings and terrorist attacks.**

Media multiplier effect: heavy news coverage amplifies economic damage beyond direct impact.

Drowning-out effect: other news displaces coverage and attenuates the behavioral response.

Research question

Investigates the impact of conflict risk on child health beyond the incidence of violent events.

What is new

Develops a new metric that captures conflict risk at the local level through a statistical model of violence, rather than relying only on realized incidents.

Why it matters

Previous literature relied on the incidence of violent events to define exposure.

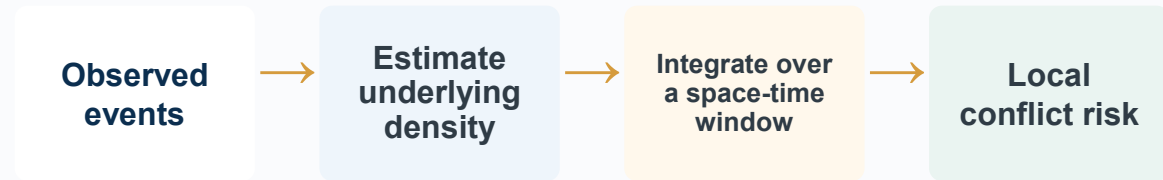
That approach cannot capture behavioral responses to conflict risk in the absence of immediate violence.

Main shift: from realized violence to the underlying risk process

How to measure risk?

Intuition

- Violence is modeled as a space-time process with an unknown distribution that drives agents' expectations.
- Each observed event is a random realization of this process.



$$\text{Risk Metric} : \int_{(s,t) \in W} \hat{f}(s,t) ds dt$$

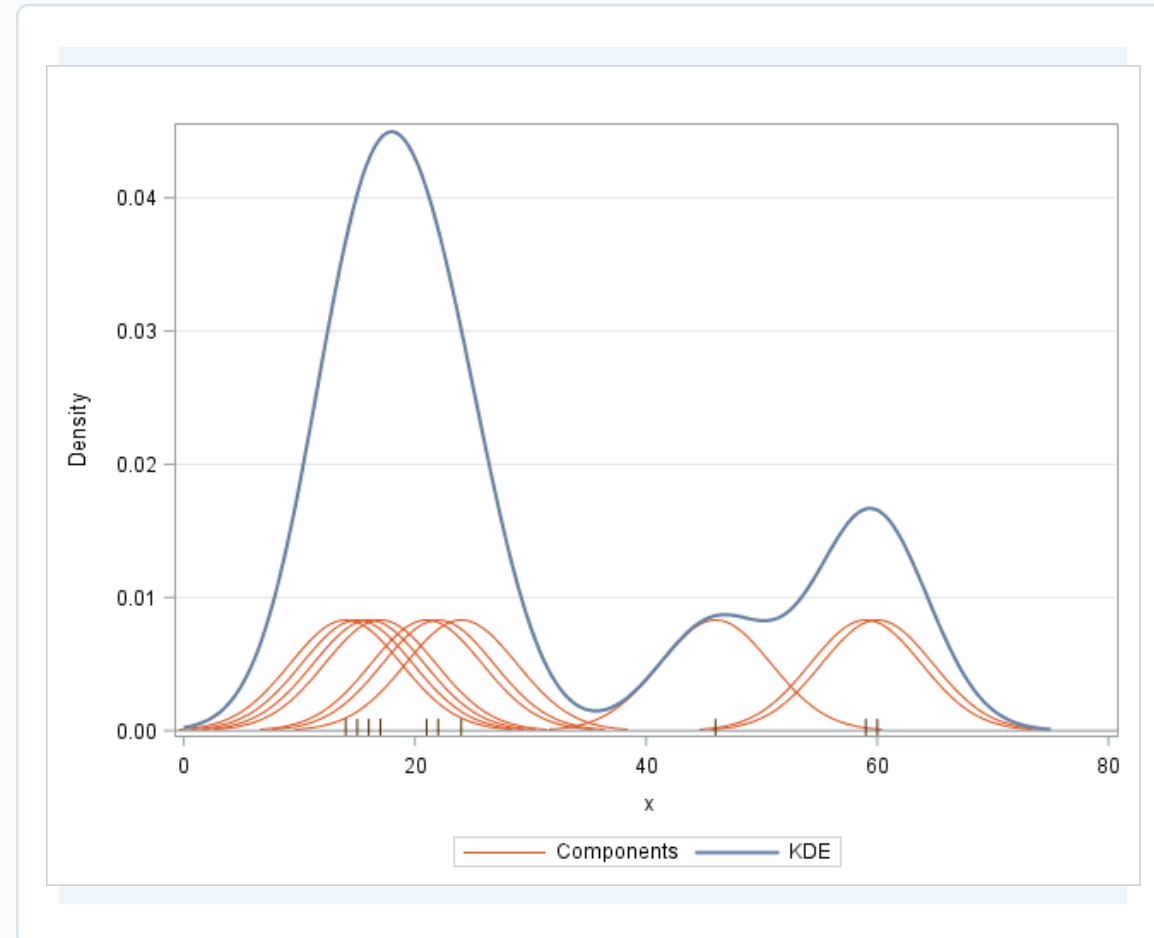
This approach captures higher moments of the violence process relative to the standard incidence-based approach.

Kernel Density Estimation: Univariate Case

$$\hat{f}(x) = \frac{1}{nh} \sum_{i=1}^n k\left(\frac{x - x_i}{h}\right)$$

Intuition

- Place a kernel at each observed event.
- The density at each location is the sum of nearby contributions: closer events matter more, and clusters produce peaks in the estimated distribution.
- Optimal h is chosen to minimize Mean Integrated Squared Error



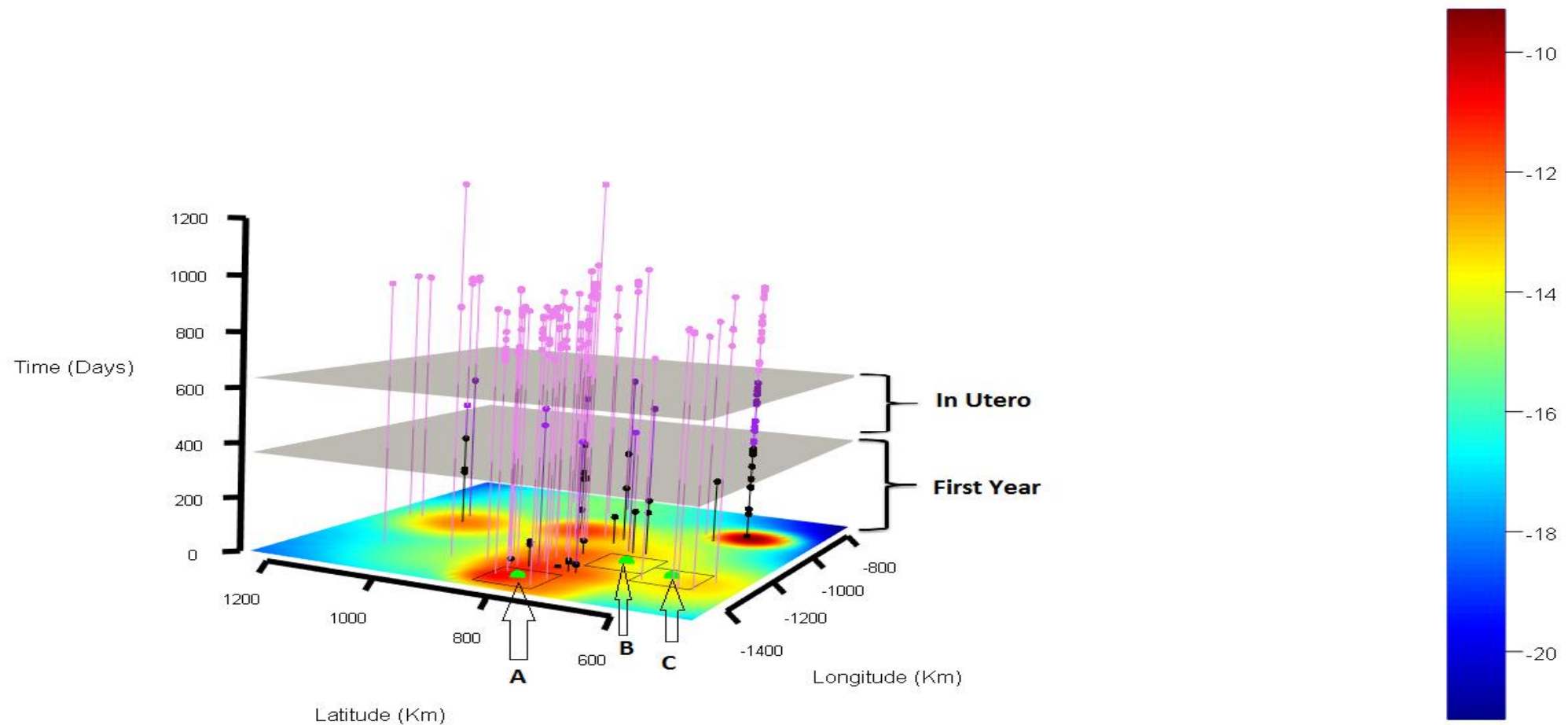


2.1

Measuring Risk in Space and Time

Risk for children conceived in September 2003 — Log Scale

HOUSEHOLDS





2.1

Preliminary Observations

Table 1

Distribution of children by risk of exposure to a conflict event and levels of observed violence in Ivory Coast.

Risk quartiles	Conflict events within 50 km					Total
	0	[1 ; 2]	[3 ; 4]	[5 ; 13]	14 +	
Q1	1144	114	24	1	0	1283
Q2	1118	109	22	6	0	1255
Q3	723	224	141	141	0	1229
Q4	183	176	170	274	393	1196
Total	3168	623	357	422	393	4963

Rows represent the probability of exposure to at least one event in utero or during the first year of life. This probability is grouped in quartiles. Columns represent the number of observed conflict incidents in utero or during the first year of life within 50 km of children's place of birth.



2.1

Conflict Risk and Infant Mortality

Main empirical results

Linking risk to child health: Overview of results

- This approach is used to evaluate the impact of conflict on child health using data from Ivory Coast and Uganda.
- The identification strategy relies on spatial and temporal variation in exposure of different birth cohorts to violence (Diff-in-Diff).
- Observed patterns of events generate some space-time windows with high risk but no violent event — and vice versa.
- Children exposed to high risk of violence suffer health setbacks even when the risk does not materialize in violence.
- The standard approach underestimates both the share of treated children and the magnitude of the treatment effect.
- Channels: quality and availability of health care, malnutrition, and maternal stress.

Key takeaway

Conflict risk matters on its own — not only realized violence.

Design emphasis

High-risk / no-event windows are central for identification.

Impact of violence risk on infant mortality in Ivory Coast

VARIABLES	Infant Mortality			
	(1)	(2)	(3)	(4)
Standardized violence risk	0.008*	0.010**	0.010**	
	(0.005)	(0.005)	(0.005)	
Low violence risk with at least 1 event within 50 km				-0.005 (0.025)
High violence risk with no event within 50 km				0.053** (0.021)
High violence risk with at least 1 event within 50 km				0.069*** (0.023)
Observations	4,963	4,963	4,944	4,944
R-squared	0.138	0.182	0.184	0.186
Cohort FE	YES	YES	YES	YES
Enumeration Area FE	YES	YES	YES	YES
Family characteristics	NO	NO	YES	YES
Child characteristics	NO	YES	YES	YES

"High violence risk" is a dummy equal to 1 if the risk is high enough not to belong to the bottom quartile of the distribution. Full set of controls includes mother's height, education, gender and age of household head, household wealth index, 12 months rainfalls (for each of the two years preceding the birth of the child and during her first year of life), birth order, time gap between conception and the previous and following pregnancies. Robust standard errors in parentheses are clustered at enumeration area level. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Information and the Economic Impact of Violence on Households: Other Key Papers

Literature map

Besley, Fetzer & Mueller (2024): dyadic tourist origin-destination credit card data; media coverage of terrorist attacks reduces tourism spending; media multiplier documented.

Alfano & Görlach (2023): terror attacks and education in Kenya; media-mediated fear reduces school attendance and test scores beyond directly affected areas.

Brodeur & Yousaf (2025): economic cost of mass shootings in the USA; local consumption drops by 2% in affected counties; media exposure extends effects spatially.

2.2

Information and the economic impact of violence on firms and investors

Beliefs, prices, and risk-taking

Information and Impact of Violence on Firms / Investors

Why financial markets are central in this literature

The literature has mostly focused on financial markets because data are available and markets play a central role in the economy.

Markets signal changes in beliefs and expectations across virtually all major sectors: investors are “putting their money where their mouths are.”



Information and Firms / Investors: Key Results

1. Financial markets co-move with conflict news

Bond and equity prices react instantaneously to news that alters perceived prospects of violence or peace. Examples: Frey & Kucher (2000), Ferguson (2006), Zussman et al. (2008), Melnick & Eldor (2010).

2. Prevailing beliefs \neq retrospective hindsight

Historical asset prices reveal that contemporary agents held different beliefs than what ex-post outcomes suggest. Examples: Willard, Guinnane & Rosen (1996); Calomiris & Pritchett (2016).

3. Information frictions create price divergence

Even highly traded assets can diverge dramatically when information flows are cut. Example: Jha, Koudijs & Salgado (2024) on the Siege of Paris.

4. Firms become more risk-averse when violence risk is high

Examples: Verdickt (2020) for WWI; Wang & Young (2020) for terrorist attacks in the USA.



3

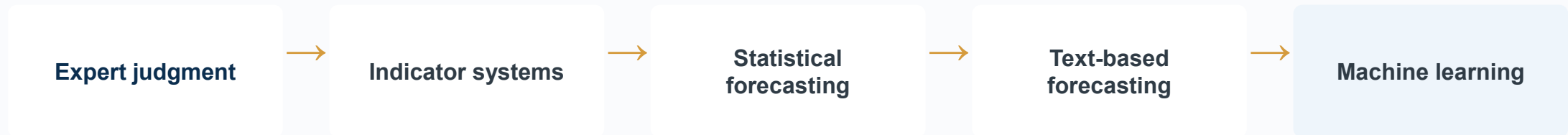
Information and conflict forecasting

From news signals to operational early-warning systems

Forecasting Conflict: Methods and Performance

Why forecasting matters

Early warning systems are crucial for policymakers and humanitarian organizations.



Key challenge

Conflict is rare, spatially concentrated, and path-dependent: baseline models must beat the naive “no change” forecast, and the precision–recall tradeoff is central.

Big Data, AI, and Conflict Forecasting: Literature

Core literature

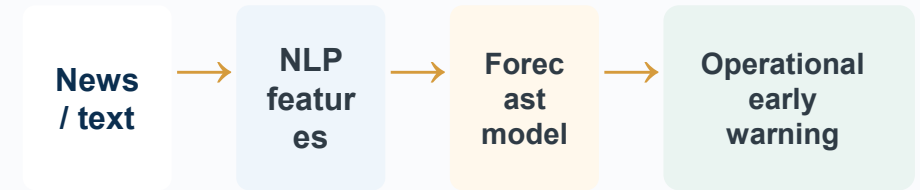
Ward et al. (2013): news articles mentioning conflict-related political events predict conflict onset.

Chadefaux (2014, Science): news media signals escalation weeks before outbreak through heavy use of certain keywords; outperforms standard indicators.

Mueller & Rauh (2018): LDA topic models on news corpora add predictive power.

Mueller & Rauh (2022): richer NLP + ensemble learning; significant AUC gains over logit baselines.

Mueller, Rauh & Ruggieri (2022): operational deployment for the UK FCDO early-warning system.



Open frontier

Social media (Twitter/X, Facebook) contains rich real-time information on beliefs and expectations that remains massively underexploited for forecasting (Petrova & Tapsoba, 2025).

Measurement

Information and media shape how conflict events are measured.

Economic impact

Information shapes how the impacts and determinants of violence are analyzed.

New media environment

Social media and changing information flows create new challenges and research questions.

Computational opportunity

Advanced ML and AI tools create new opportunities to tackle these questions.

Thank you

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Information
Beliefs
Behavior
Forecasting