# Humanitarian reports on ReliefWeb as a domain-specific corpus

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# What is ReliefWeb?

- 25+ year-old service
- 10.8 million users
- 1 million reports

"the principal information system for prevention, preparedness, and rapid response for the humanitarian community"

(Naidoo, 2007; OCHA, 2022; Ruso, 1996, p.18; Wackernagel & Footner, 2021)

https://www.unocha.org/

https://reliefweb.int/

# ReliefWeb’s value for linguists

- ReliefWeb Labs tracking tools
- Full API access
- Discursively track famine
- Knowledge extraction via semantic embedding

https://labs.reliefweb.int/

(Rubin, 2014; Shamoug, Cranefield & Dick, 2023)

# Shared goals

- Improve humanitarian response by leveraging linguistic data

- Address challenges synthesizing & transmitting domain knowledge

# Objectives

- Develop corpus from API data
- Analyze database's composition
- Gauge suitability & limits
- Facilitate research in humanitarian knowledge extraction

# Immediate applications

- Humanitarian Encyclopedia (HE)
  - 129 humanitarian concepts
  - Foster expert, linguist & community dialogue
  - Study multidimensionality

https://humanitarianencyclopedia.org/

(Chambó & León-Araúz, 2021; León-Araúz, 2017)

# Background

- Effect-size keyness analysis
  - RW & HE corpora
- Knowledge-rich contexts (KRCs)
- Frame-Based Terminology

(Condamines, 2022; Faber, 2022; Gabrielatos, 2018; Kilgarriff, 2012; Marshman, 2022;  Meyer, 2001; Sierra et al., 2008)

- Corpus query language
- Sketch Engine API wrapper: *Sketch Grammar Explorer*

(Isaacs, 2022; Jakubíček et al., 2010; León-Araúz & San Martín, 2018; San Martín et al., 2020)

github.com/engisalor/sketch-grammar-explorer

# Analysis

## Main concern

Are ReliefWeb reports (short HTML docs, incl. summaries) a good source of data for studying humanitarian concepts?

## Procedure

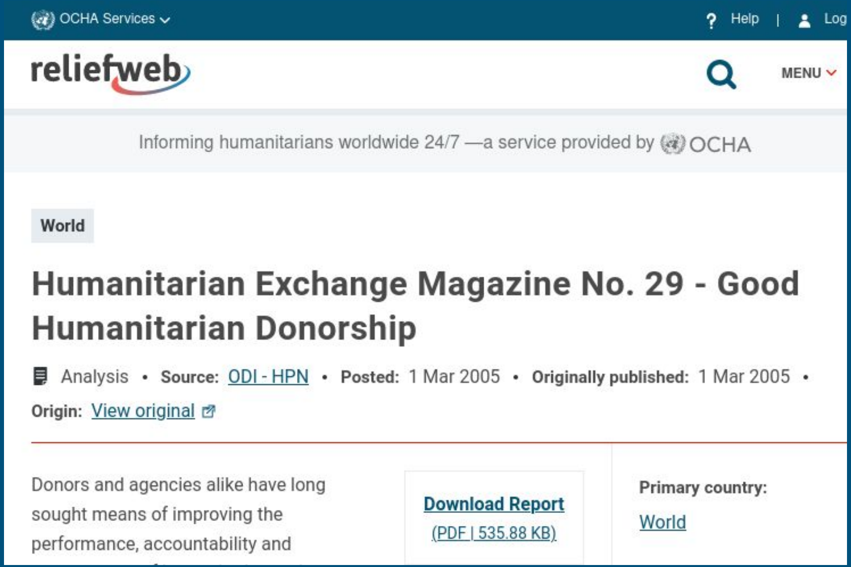
Compare ReliefWeb (RW) corpus w/ Humanitarian Encyclopedia (HE)

1. Concept keyness
2. Concept frequencies (annual)
3. KRCs (hypernymic & definitional)

# Corpus creation

- 662,473 reports (67%)
- English HTML content (PDFs excluded)
- Python code available on GitHub: *Corpusama*

https://github.com/engisalor/corpusama



Informing humanitarians worldwide 24/7 —a service provided by OCHA

World

Humanitarian Exchange Magazine No. 29 - Good Humanitarian Donorship

Analysis • Source: ODI - HPN • Posted: 1 Mar 2005 • Originally published: 1 Mar 2005 • Origin: View original

Donors and agencies alike have long sought means of improving the performance, accountability and

Download Report (PDF | 535.88 KB)

Primary country: World

https://reliefweb.int/node/23456

# Corpus creation

- Stanza NLP pipeline
- Universal Dependencies EWT treebank
- NoSketch Engine Docker

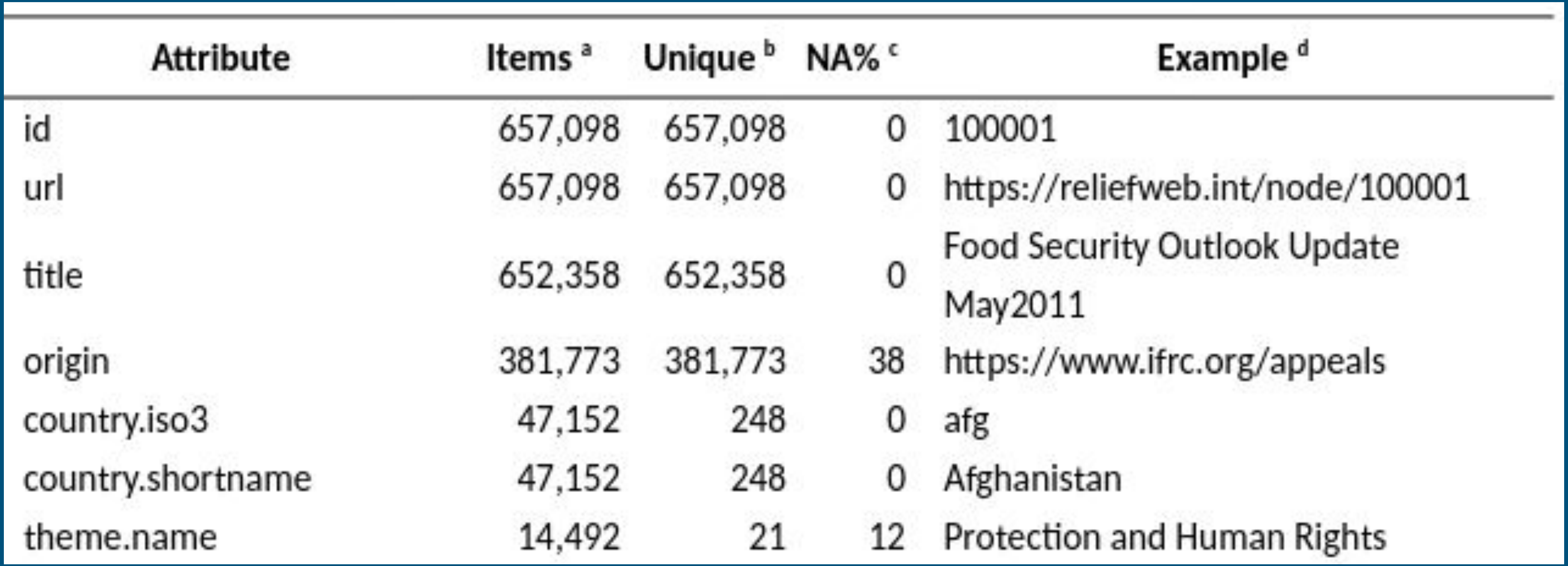
(ELTE-DH, 2023; Kilgarriff et al., 2014; Qi et al., 2020; Rychlỳ, 2007; Silveira et al., 2014)

# Corpus composition

- 657,098 documents
- 431,170,905 tokens
- 366,049,459 words
- 16,809,660 sentences
- 557 words/doc avg.

- Selection of API fields
- Preserve data structure
  - Multivalue fields (e.g., multiple affected countries)

# Corpus composition



| Attribute | Items [a] | Unique [b] | NA% [c] | Example [d] |
|---|---:|---:|---:|---|
| id | 657,098 | 657,098 | 0 | 100001 |
| url | 657,098 | 657,098 | 0 | https://reliefweb.int/node/100001 |
| title | 652,358 | 652,358 | 0 | Food Security Outlook Update May2011 |
| origin | 381,773 | 381,773 | 38 | https://www.ifrc.org/appeals |
| country.iso3 | 47,152 | 248 | 0 | afg |
| country.shortname | 47,152 | 248 | 0 | Afghanistan |
| theme.name | 14,492 | 21 | 12 | Protection and Human Rights |

# Corpus composition

- 248 countries (incl. “World”)
- Focus on African & Eastern Mediterranean WHO regions
- 2,708 organizations, esp. UN-related

- Natural disasters
  - flood, epidemic
- Themes
  - human rights, health, food & nutrition
- Genres
  - news, press releases & situation reports

# Keyness analysis

- 129 Humanitarian Encyclopedia concepts
- Compared shared years for RW & HE corpora
- K>1 count=10
- K<0.5 count=87
- K<0.25 count=38

## Keyness for shared years

| | | |
|---|---|---|
| min | <= | 0.006 |
| Q1 | = | 0.232 |
| Q2 | = | 0.358 |
| Q3 | = | 0.552 |
| max | = | 2.199 |

# Diachronic trends

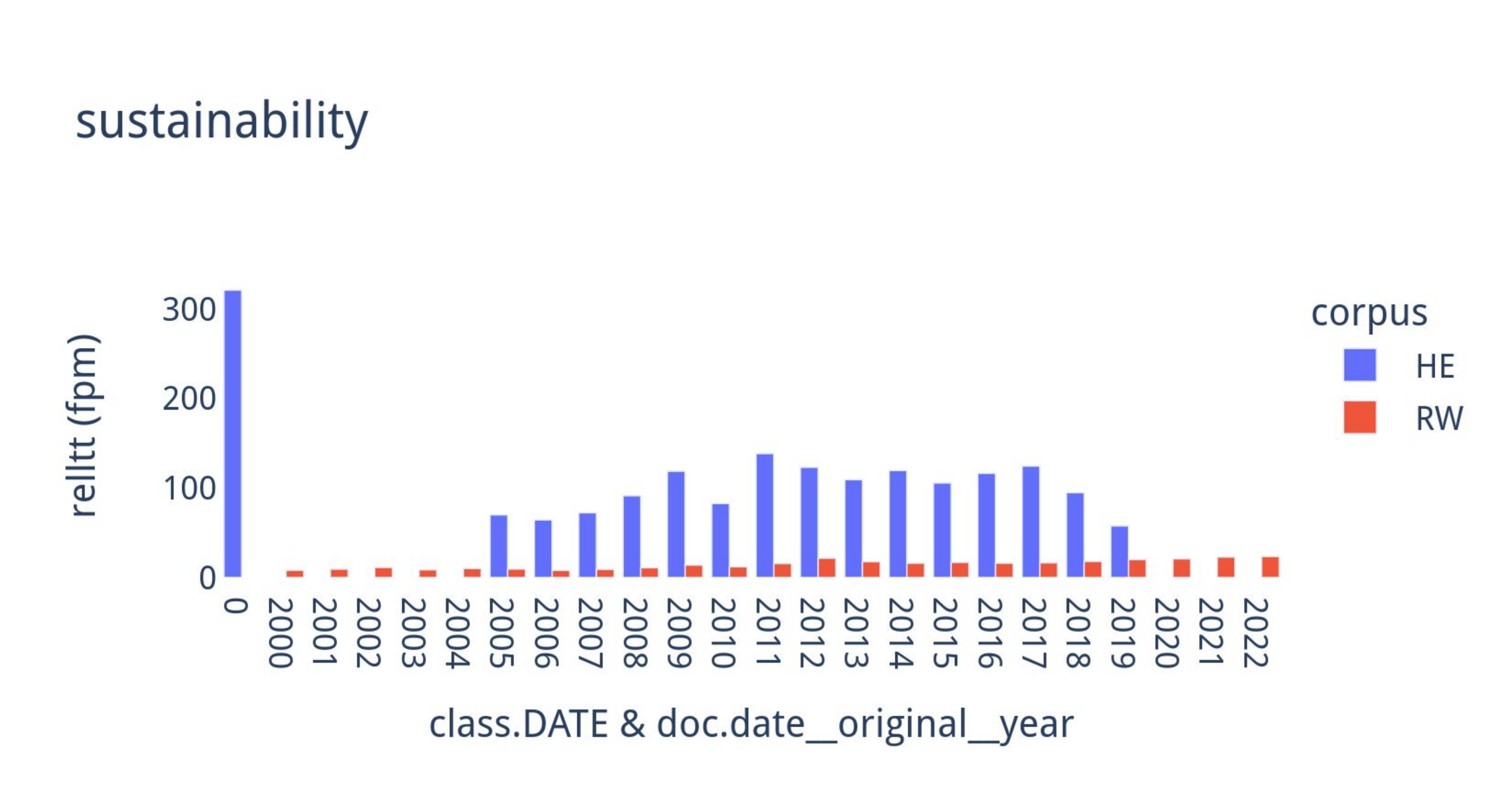
## Selected concepts

- HUMANITARIAN REFORM
- SUSTAINABILITY
- RESILIENCE
- GENDER-BASED VIOLENCE
- SETTLEMENT
- SOVEREIGNTY

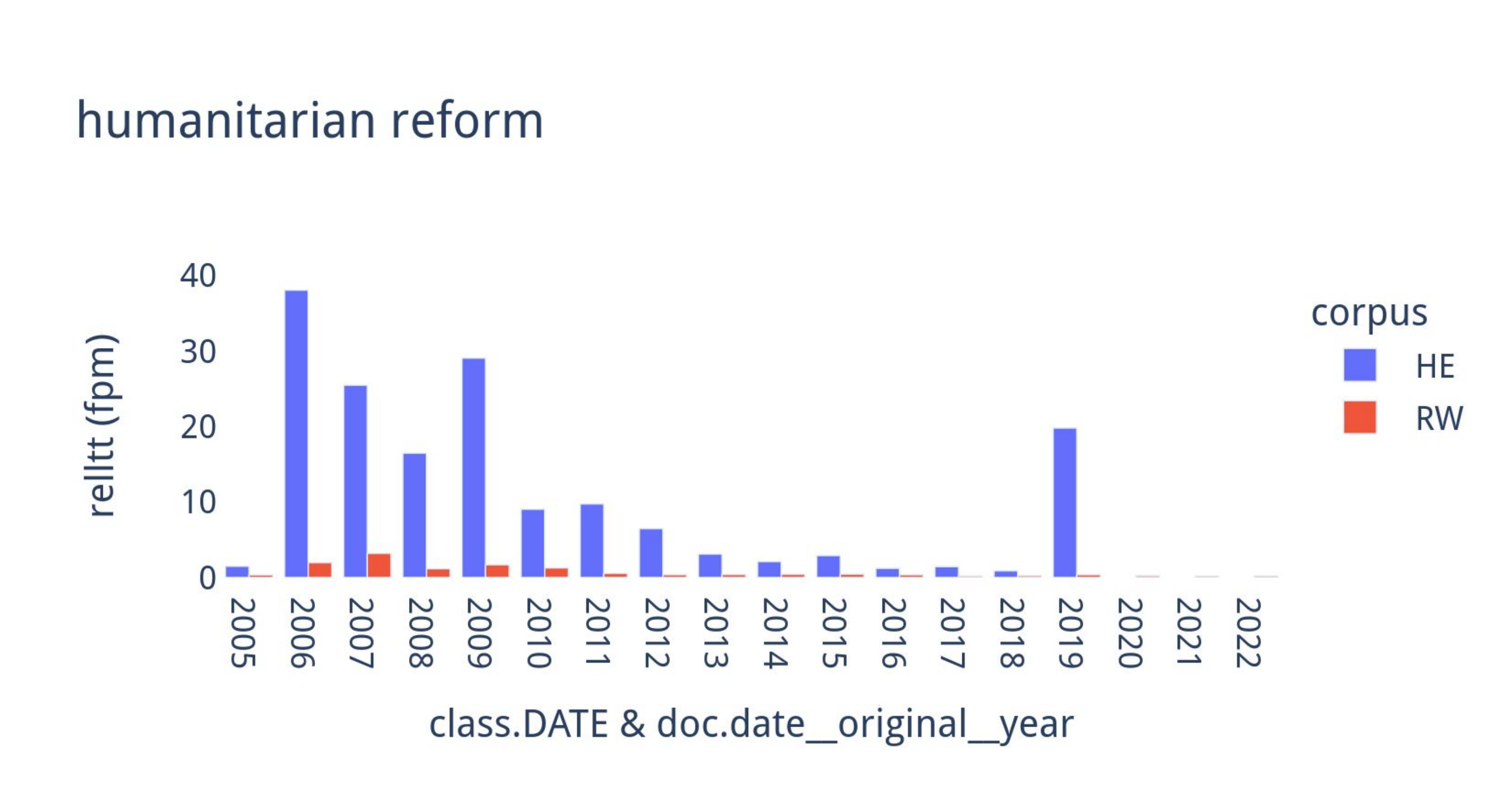
# Diachronic trends

- Corpora cover similar time period (~2000-2020)
  - Additional RW years inflate whole-corpus keyness
- Overlap between corpora?
- HE tagging irregularities
- Often flat or upward trends

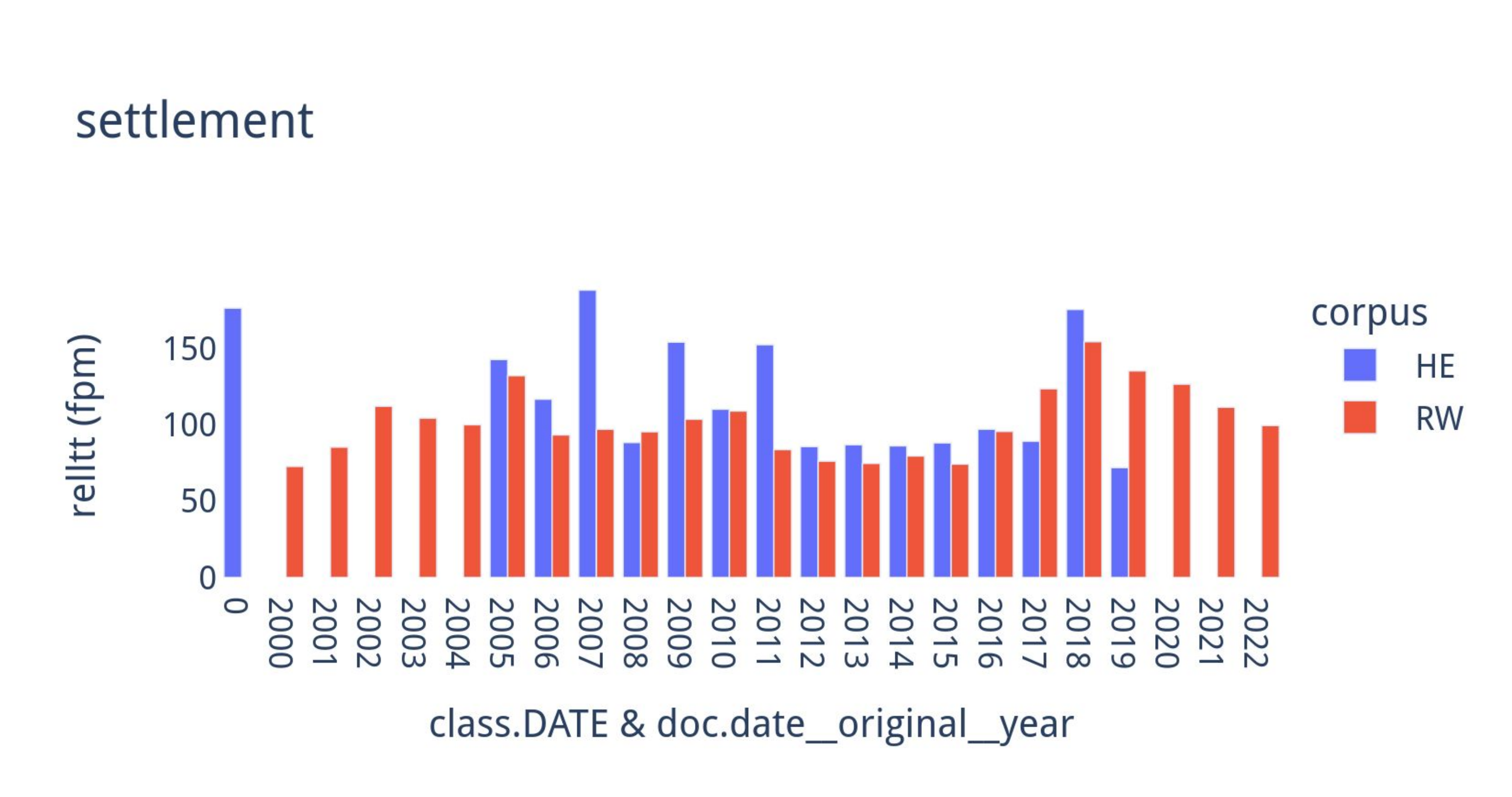
# Concepts with K<Q1



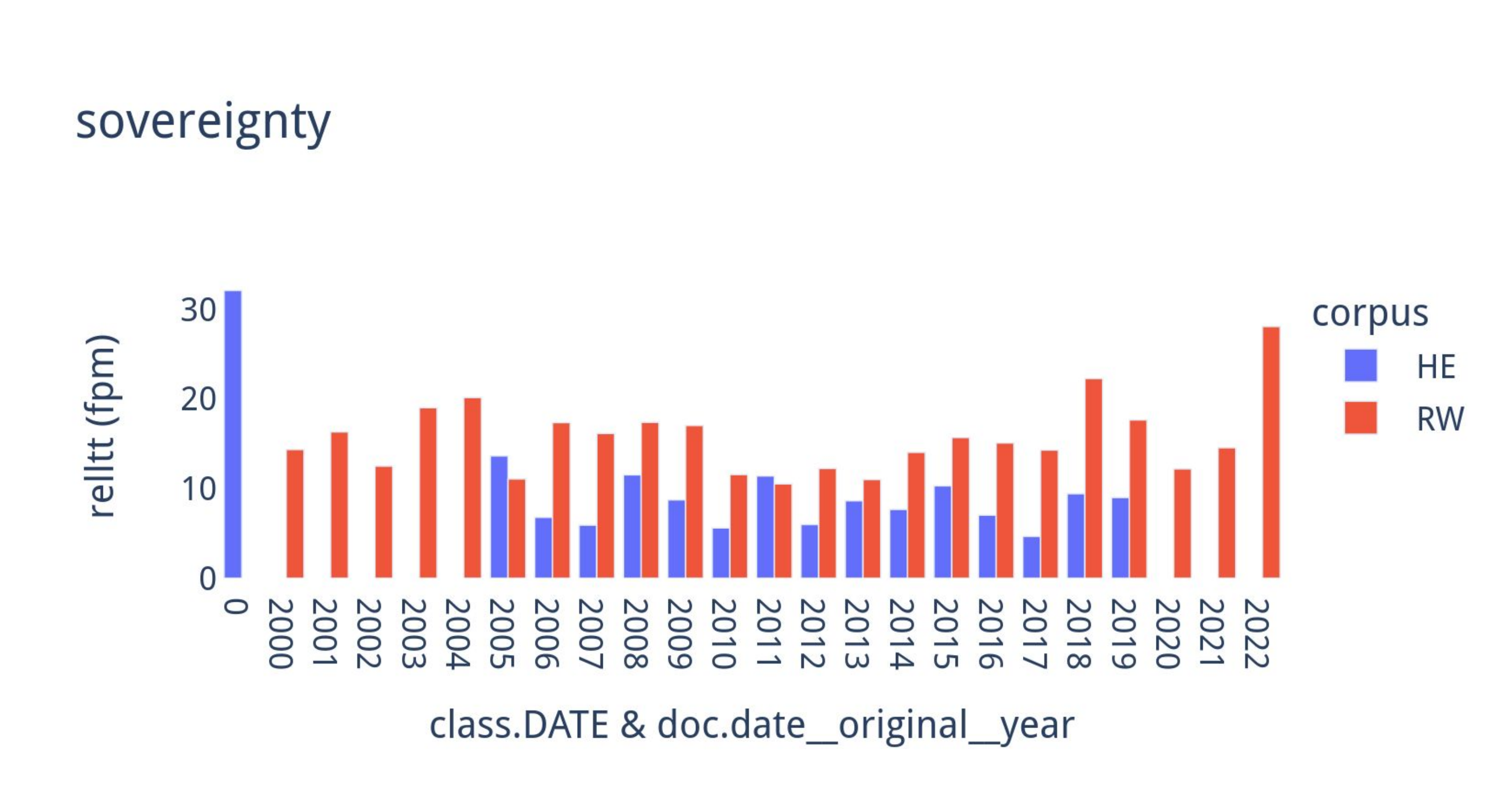
# Concepts with K<Q1



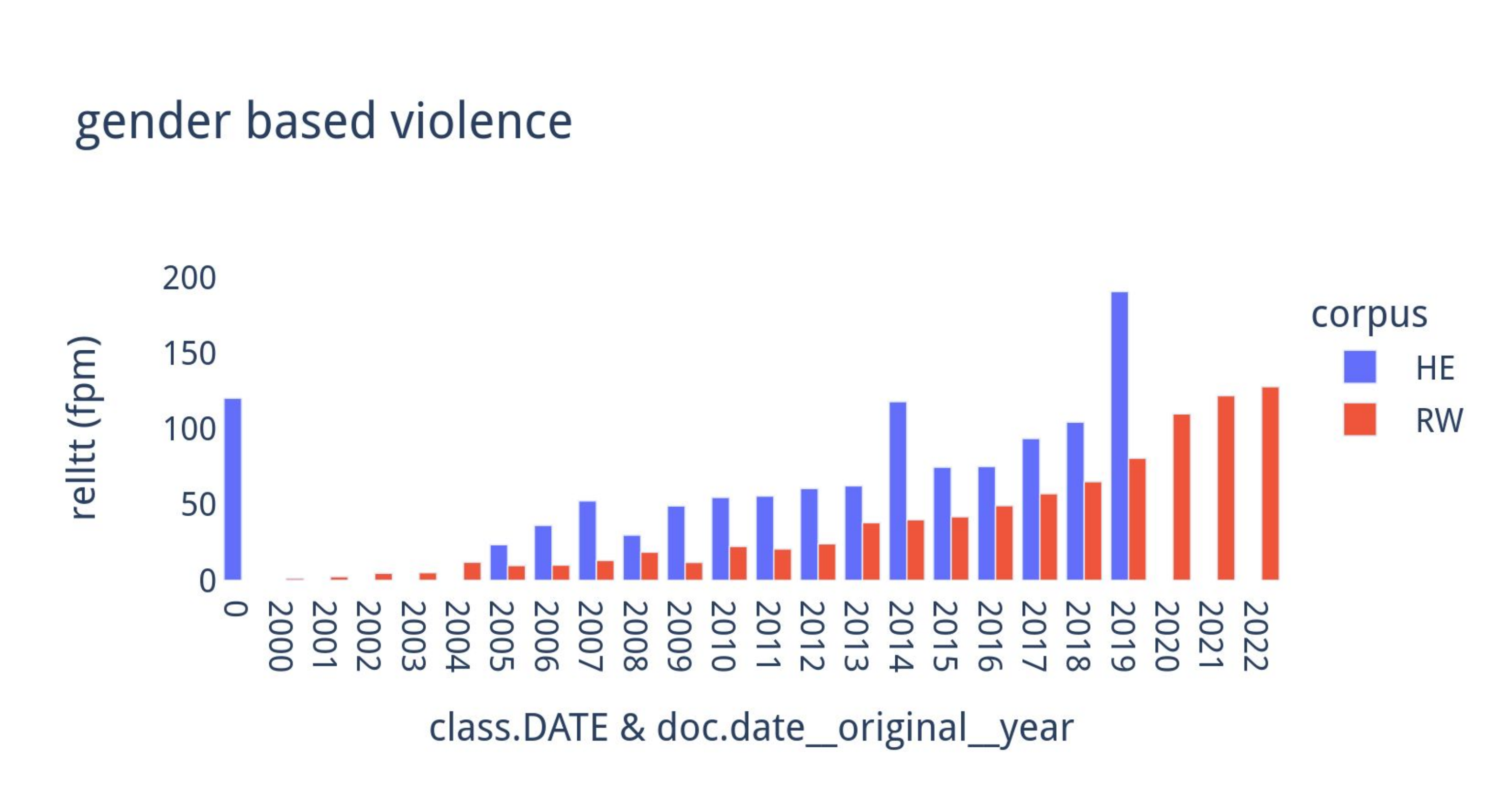
# Concepts with K>Q3



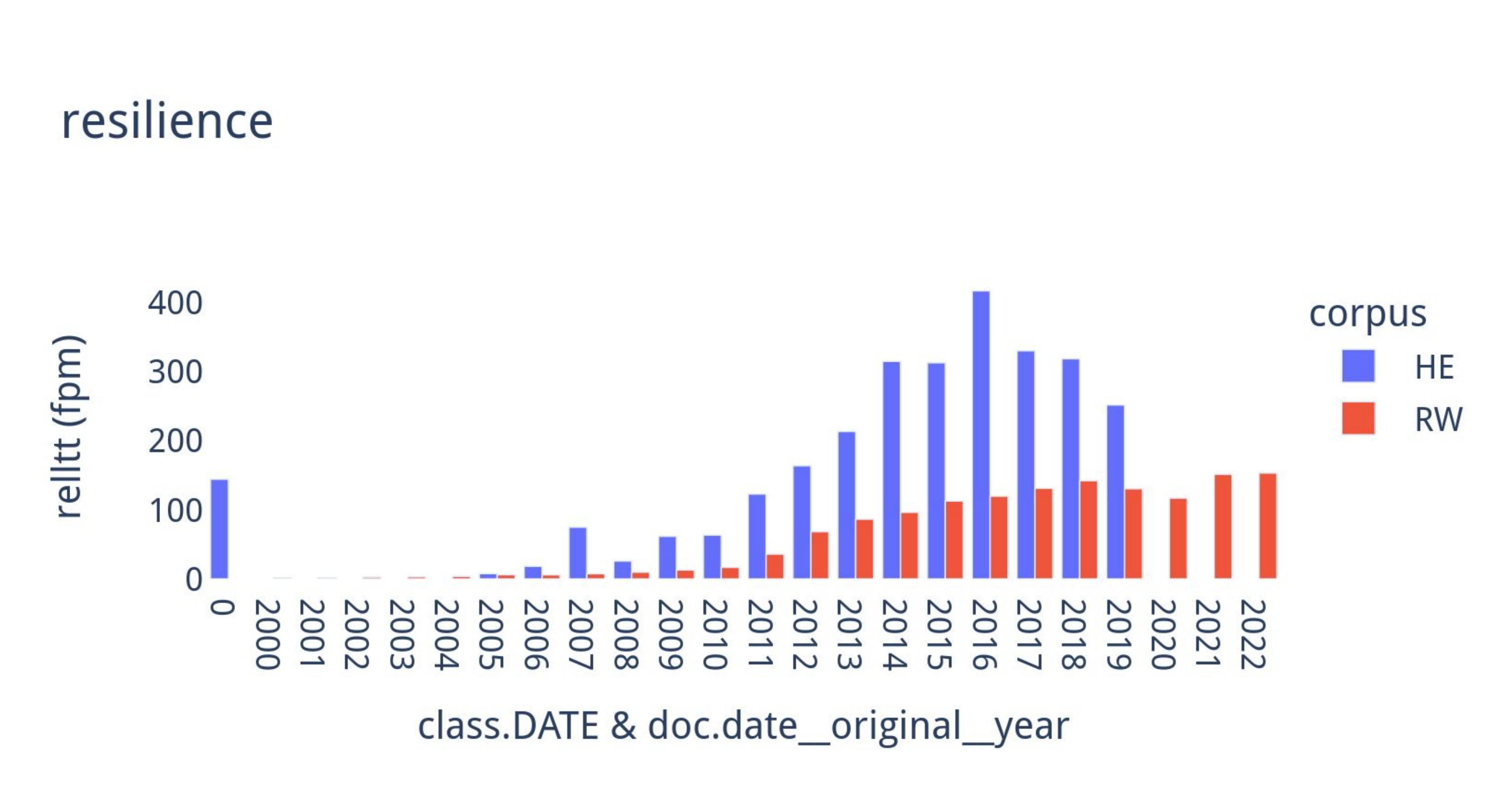
# Concepts with K>Q3



# Concepts with upward trends



# Concepts with upward trends



# KRC analysis

## Example KRC

**“Resilience is also a contested term in the literature”** (RW corpus)

| **Hyponym** | **Relation** | **Hypernym** |
|---|---|---|
| **resilience** | **IS_A** | **term** |

## Procedure

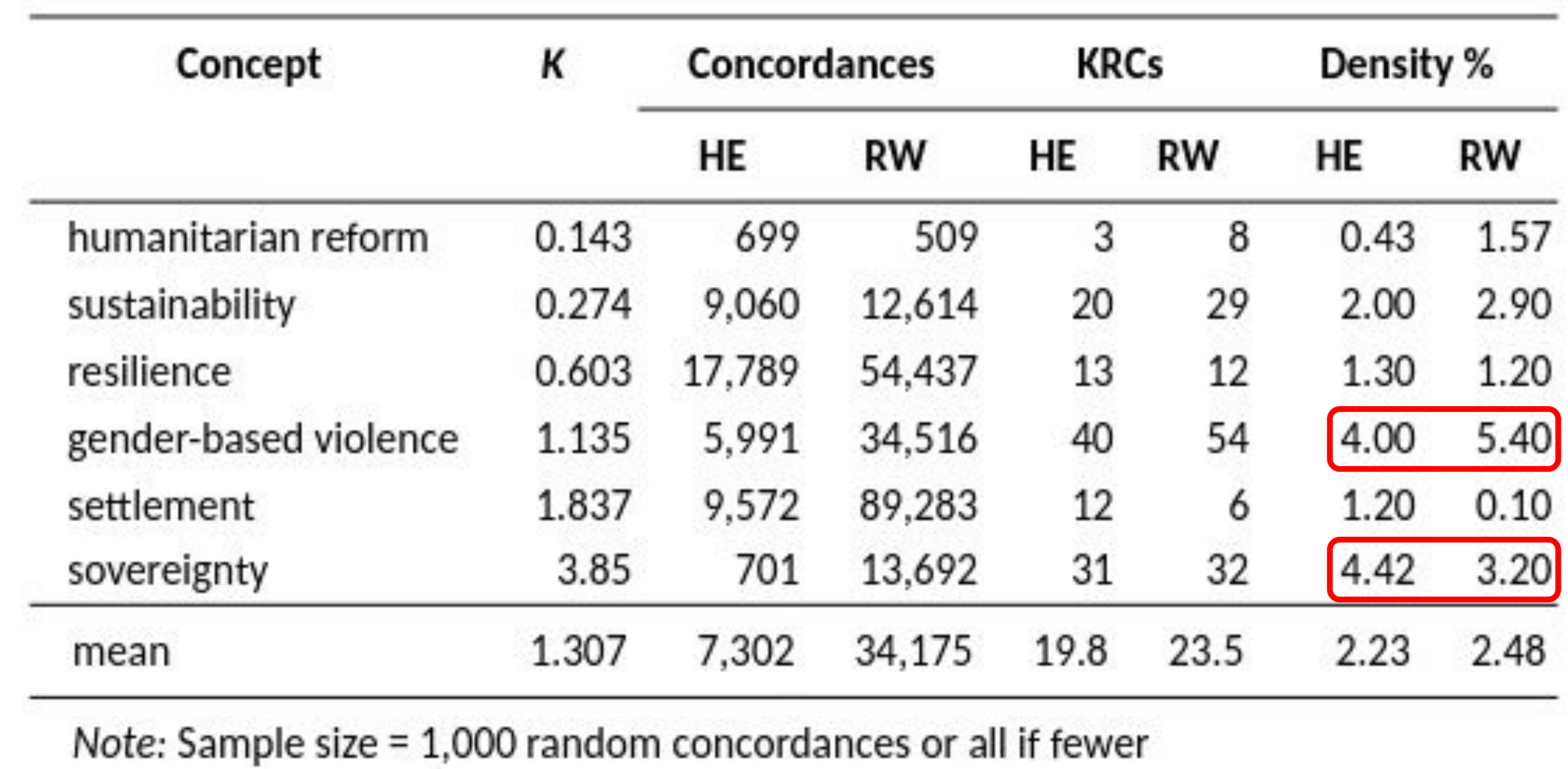
For sample concepts, compare

1. KRC density
2. Hypernyms (shared/unique)
3. Definitional contexts

# KRC density

- Samples of <=1,000 concordances
- Similar avg. densities, RW slightly higher
- RW = 2.48%
- HE = 2.23%

# KRC density



| Concept | *K* | Concordances |  | KRCs |  | Density % |  |
|---|---|---|---|---|---|---|---|
|  |  | HE | RW | HE | RW | HE | RW |
| humanitarian reform | 0.143 | 699 | 509 | 3 | 8 | 0.43 | 1.57 |
| sustainability | 0.274 | 9,060 | 12,614 | 20 | 29 | 2.00 | 2.90 |
| resilience | 0.603 | 17,789 | 54,437 | 13 | 12 | 1.30 | 1.20 |
| gender-based violence | 1.135 | 5,991 | 34,516 | 40 | 54 | 4.00 | 5.40 |
| settlement | 1.837 | 9,572 | 89,283 | 12 | 6 | 1.20 | 0.10 |
| sovereignty | 3.85 | 701 | 13,692 | 31 | 32 | 4.42 | 3.20 |
| mean | 1.307 | 7,302 | 34,175 | 19.8 | 23.5 | 2.23 | 2.48 |

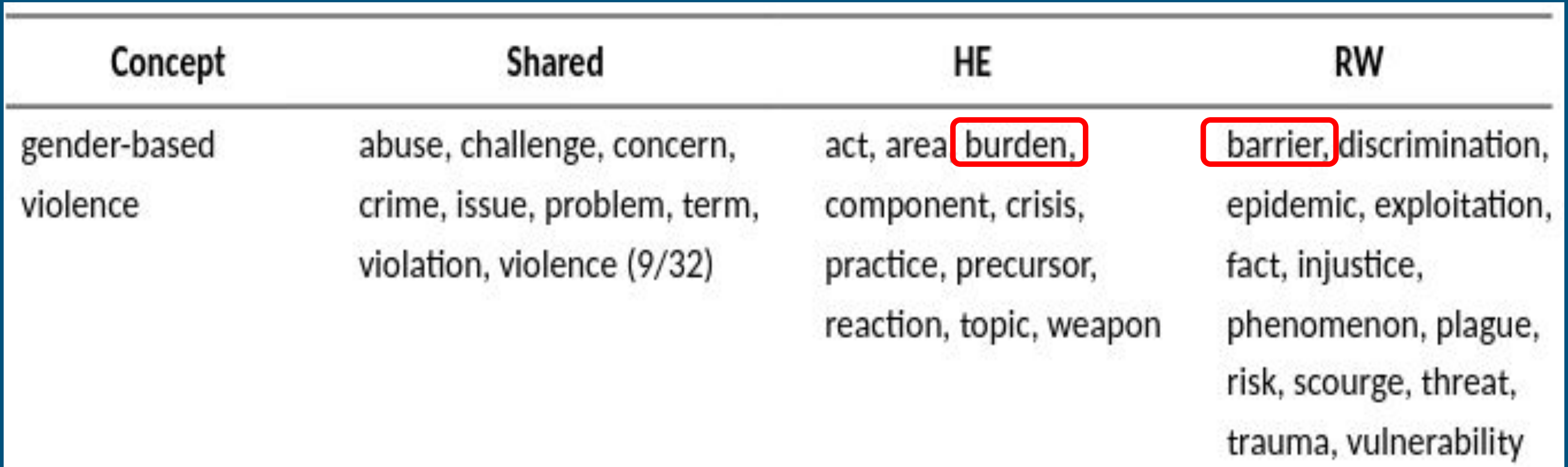
*Note*: Sample size = 1,000 random concordances or all if fewer

# Shared hypernyms

- 260 contexts extracted
- 104 hypernyms
- 24% shared across corpora

- HE = 34 unique
- RW = 45 unique

# Shared hypernyms



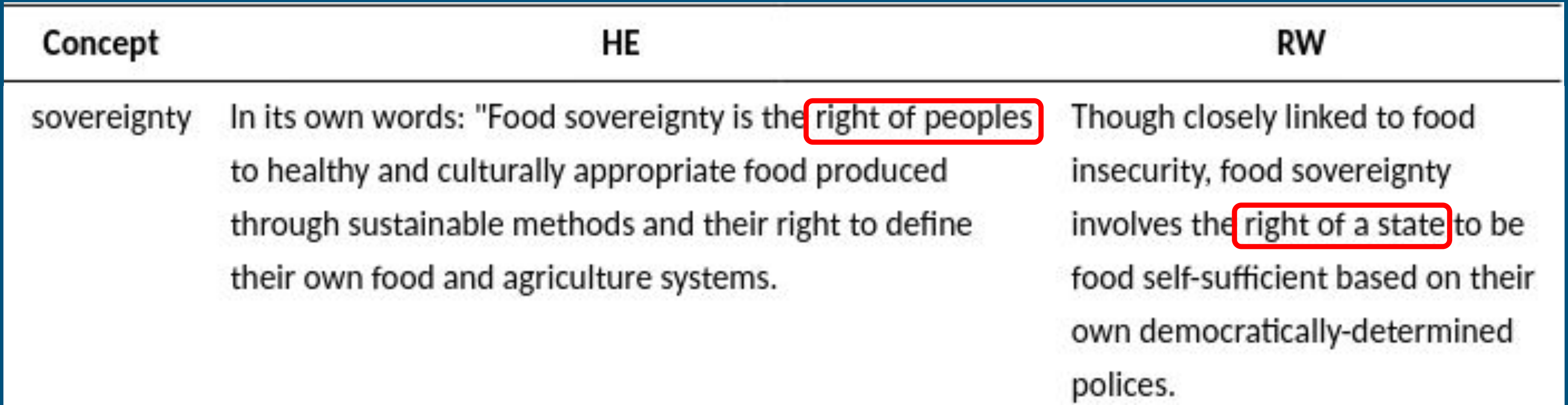
| Concept | Shared | HE | RW |
|---|---|---|---|
| gender-based violence | abuse, challenge, concern, crime, issue, problem, term, violation, violence (9/32) | act, area, burden, component, crisis, practice, precursor, reaction, topic, weapon | barrier, discrimination, epidemic, exploitation, fact, injustice, phenomenon, plague, risk, scourge, threat, trauma, vulnerability |

# Definitional contexts

- Only 3 concepts w/ definitions

| | |
|---|---|
| RESILIENCE | More contextualized in RW |
| GENDER-BASED VIOLENCE | Similar |
| SOVEREIGNTY | Similar; FOOD SOVEREIGNTY |

# Definitional contexts



| Concept | HE | RW |
|---|---|---|
| sovereignty | In its own words: "Food sovereignty is the right of peoples to healthy and culturally appropriate food produced through sustainable methods and their right to define their own food and agriculture systems. | Though closely linked to food insecurity, food sovereignty involves the right of a state to be food self-sufficient based on their own democratically-determined polices. |

# Discussion

- Low concept frequencies in RW HTML texts

↓

- Similar diachronic & KRC results

- More EVENTS afflicting populations
  - EPIDEMIC, FAMINE, …

↓

- Fewer humanitarian PROCESSES
  - ADVOCACY, SUSTAINABILITY, …

# Next steps

- Full concept analyses
- Study variation in more text types
- Underway:
  - Complete corpora (HTML & PDF)
  - Multiple languages (EN, FR, ES, ?)
  - HE Concept Tracker

    https://humanitarianencyclopedia.org/analysis

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DE GRANADA

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  - NoSketch Engine
  - Stanza NLP
  - ELTE-DH

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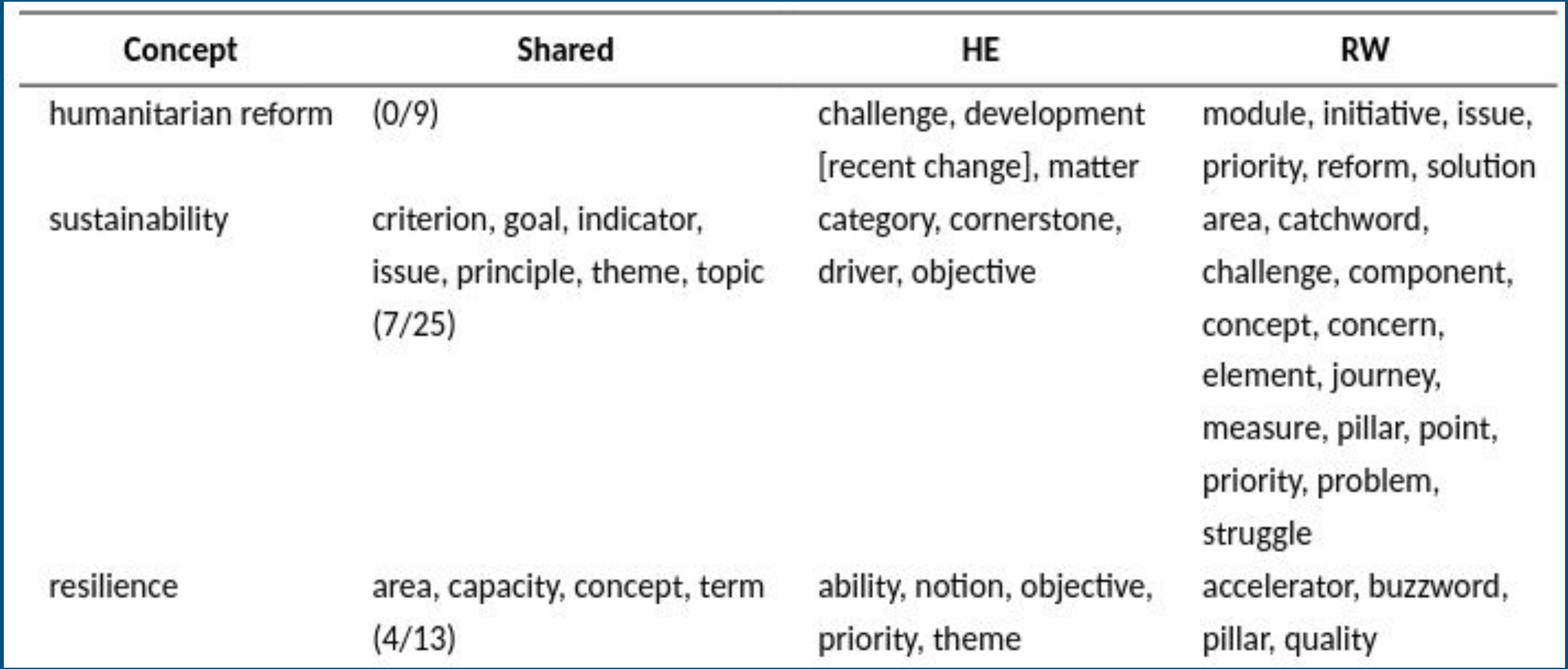
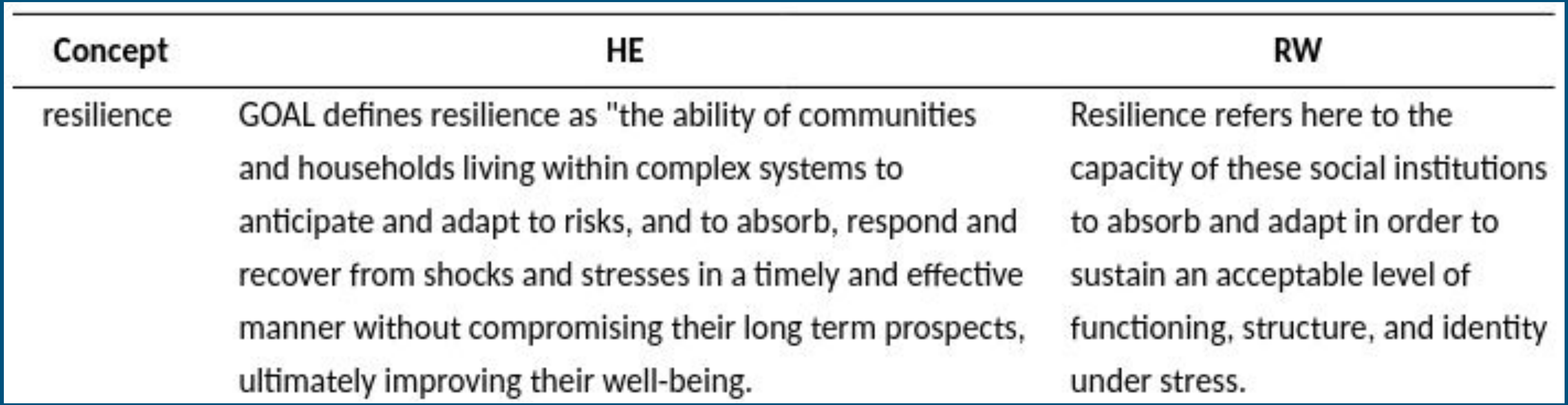
# Appendix

# Shared hypernyms



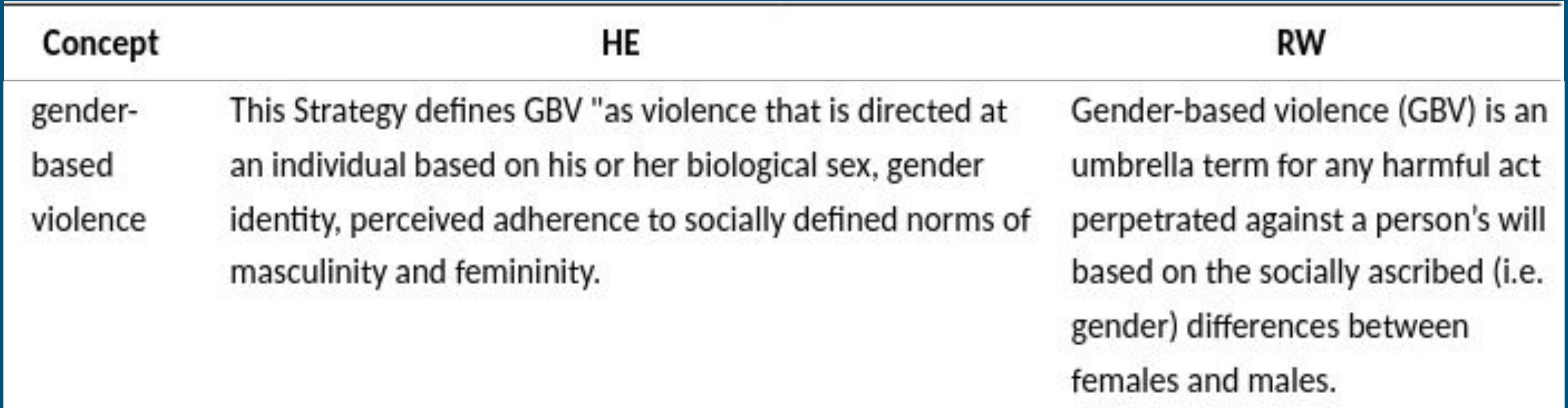
| Concept | Shared | HE | RW |
|---|---|---|---|
| humanitarian reform | (0/9) | challenge, development [recent change], matter | module, initiative, issue, priority, reform, solution |
| sustainability | criterion, goal, indicator, issue, principle, theme, topic (7/25) | category, cornerstone, driver, objective | area, catchword, challenge, component, concept, concern, element, journey, measure, pillar, point, priority, problem, struggle |
| resilience | area, capacity, concept, term (4/13) | ability, notion, objective, priority, theme | accelerator, buzzword, pillar, quality |

# Definitional contexts



| Concept | HE | RW |
|---|---|---|
| resilience | GOAL defines resilience as "the ability of communities and households living within complex systems to anticipate and adapt to risks, and to absorb, respond and recover from shocks and stresses in a timely and effective manner without compromising their long term prospects, ultimately improving their well-being. | Resilience refers here to the capacity of these social institutions to absorb and adapt in order to sustain an acceptable level of functioning, structure, and identity under stress. |

# Definitional contexts



| Concept | HE | RW |
|---|---|---|
| gender-based violence | This Strategy defines GBV "as violence that is directed at an individual based on his or her biological sex, gender identity, perceived adherence to socially defined norms of masculinity and femininity. | Gender-based violence (GBV) is an umbrella term for any harmful act perpetrated against a person's will based on the socially ascribed (i.e. gender) differences between females and males. |