

The Discursive Evolution of Human Rights Law: Empirical Insights from a Computational Analysis of 180,000 UN Recommendations

Renana Keydar* , Vera Shikhelman** , Tomer Broude***  and Jonathan Elkobi# 

ABSTRACT

Building on an independent database of 180,000 UN recommendations and a novel computational method, we present the most comprehensive study of human rights (HR) debates to date. We develop a unique empirical model that measures topical density of discourse. This innovative instrument measures the discursive activity of UN HR bodies through a machine-learning textual analysis of their outputs, offering a dynamic map of evolving trends in human rights, both over time (diachronically) and across different mechanisms (synchronously) within the UN HR ecosystem. Leveraging this comprehensive dataset and sophisticated computational methodologies, we identify which protected groups are central to different mechanisms' attention and highlight the major human rights issues that have witnessed significant changes in attention. Our research presents significant findings on the density of UN HR discourse and its implications for two major debates in the field of HR law—HR proliferation and the structural critique of UN HR bodies.

KEY WORDS: United Nations human rights bodies, human rights, natural language processing, human rights proliferation, international human rights institutions, structural critique of the United Nations

1. INTRODUCTION

Monitoring and tracing the discursive focus of the United Nations (UN) human rights system is vital for several key reasons. Firstly, given the leading role that the UN has in the human rights universe, its trajectories of human rights discourse, policies, and protections can have profound

* Senior lecturer (tenure track) of Law and Digital Humanities at the Hebrew University of Jerusalem, Israel; renana.keydar@mail.huji.ac.il

** Research Affiliate, Faculty of Law at the Hebrew University of Jerusalem, Israel; vera.shikhelman@gmail.com (equal contribution)

*** Dean, Bessie and Michael Greenblatt, Q.C., Chair in Public and International Law at the Faculty of Law and Department of International Relations at the Hebrew University of Jerusalem, Israel; tomerbroude@gmail.com

B.A. student of Business Administration and East Asian Studies at the Hebrew University of Jerusalem, Israel; jonathan.elkobi@mail.huji.ac.il

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impacts on millions of people worldwide. Additionally, understanding this focus can guide policy development and implementation, provide insights into geopolitical trends, and inform advocacy efforts. Moreover, assessing and monitoring the work of UN human rights institutions on a large scale provides an essential level of transparency.¹ It allows all stakeholders—member states, non-governmental organizations, civil society, and global citizens—to understand the priorities of these institutions and enables a more thorough evaluation of their activities. Finally, it allows for more effective, targeted actions towards advancing and safeguarding human rights.

However, given the large number of mechanisms and players in the UN human rights system, and the large amount of data in the form of written documents produced by these institutions, no systematic efforts have been made thus far (to the best of our knowledge) to trace the evolution of the discourse of human rights in the UN system. Without an empirical model of assessment of UN discourse, we cannot detect which topics and themes occupy the attention of the various UN human rights institutions at any given time and cannot evaluate the actual work done by these bodies. Do all these assumed trends really enjoy the same popularity in the UN human rights discourse, or are some more dominant in the UN activity, while others marginalized?

In this article, we present findings from the most comprehensive empirical study of UN human rights recommendations to date, employing an optimal, yet under-explored, source of data: the Universal Human Rights Index (UHRI).² The UHRI contains approximately 180,000 recommendations made by the UN human rights system, comprising the international human rights treaty bodies (TB),³ the Human Rights Council's Universal Periodic Review (UPR),⁴ and the HRC Special Procedures (SP).⁵ We secured access to the data aggregated in the UHRI, containing more than 1,860,000 words, sourced from 2985 documents, spanning 15 years and nearly 60 UN human rights mechanisms.⁶ This original corpus serves as our main data source, providing an unparalleled resource for charting the different, sometimes competing, trends in the spatial development of the UN human rights ecosystem, as reflected in the work of its various mechanisms, and the diverse normative sources that they cover. Our focus is on understanding what these recommendations reveal about the current state, future direction, and assessable activity of the UN human rights system.

The sheer size of the corpus exceeds the scale of effective human textual scrutiny, demanding new modes of analysis that will enable its comprehensive examination and assessment. Therefore, we devise a new methodology for assessing the discourse and attention of UN human rights mechanisms: the *Density of Discourse* model. The *density* model builds on advanced machine learning (ML) techniques from the field of natural language processing (NLP), which has so far

¹ For example, see Soeiro, 'Transparent Governments, Social Innovation, and Their Role in Achieving the SDGs' in Filho (ed), *Encyclopedia of the UN Sustainable Development Goals*, (2021) 1 at 1–12; Grønbech-Jensen, 'The Scandinavian Tradition of Open Government and the European Union: Problems of Compatibility?' (1998) 5 *Journal of European Public Policy* 185; Eijffinger and Geraats, 'How Transparent are Central Banks?' (2006) 22 *European Journal of Political Economy* 1; Valencia et al., Amira, Queiruga and González-Benito: 'Relationship Between Transparency and Efficiency in the Allocation of Funds in Nongovernmental Development Organizations' (2015) 26 *International Journal of Voluntary and Nonprofit Organizations* 2517; Reinsberg and Swedlund, 'How Transparent are Aid Agencies to Their Citizens? Introducing the Citizen Aid Transparency Dataset' (2023) 35 *Journal of International Development* 2177; Licht, 'Do We Really Want to Know? The Potentially Negative Effect of Transparency in Decision Making on Perceived Legitimacy' (2011) 34 *Scandinavian Political Studies* 183.

² OHCHR website, Universal Human Rights Index (UHRI), available at: uhri.ohchr.org/en/ [last accessed 20 june 2024]. The UHRI is very much a brainchild of Prof. Christof Heyns, who encouraged us to pursue this project not long before his tragic death in 2021.

³ Ibid. at www.ohchr.org/EN/HRBodies/Pages/TreatyBodies.aspx [last accessed 20 june 2024].

⁴ Ibid. at www.ohchr.org/en/hrbodies/upr/pages/uprmain.aspx [last accessed 20 june 2024].

⁵ Ibid. at www.ohchr.org/EN/HRBodies/SP/Pages/Welcomepage.aspx [last accessed 20 june 2024].

⁶ While the UHRI includes tagging of topics that is helpful for legal research, it is not sufficiently systematic and comprehensive for the purpose of our research and opted instead for an unsupervised approach, as detailed in section 3 below.

only sparsely been applied to international law in general,⁷ and international human rights in particular.⁸ Performing automated content analysis on the entire UHRI corpus, the *Density of Discourse model* tracks substantial changes in the topical composition of the recommendations of the various UN human rights bodies over the period of time covered in the data (diachronic trends) as well as the structural dynamics of which mechanisms are engaged with which topics at any given moment (synchronic trends).

Our research addresses two levels of systemic analysis that correspond to major contemporary debates and critiques in the literature on the development of human rights that we discuss in section 2. The first level is the material level concerning the puzzle of proliferation—what are the topics that the UN human rights system discusses, where does its discursive attention lie and how does this attention proliferate and become denser over time, as more issues and topics are being discussed by more UN bodies and in more UN documents over time? The second level regards the organizational sphere concerning the changing power dynamics between the mechanisms of human rights—who are the players that are invested in the discourse and what do patterns of density reveal about overlaps, gaps, over and under-emphases of different mechanisms and bodies in relation to their respective mandates and spheres of influence? As will be explained in Section 4, the computational Density of Discourse model allows us to evaluate empirically and better understand conceptually, the discursive attention of the UN human rights system on these two significant levels: the material and organizational. However, we do not argue for any causality in our analysis. Concurrently, the computational analysis of the system's overall density, through the measurement of the dynamics of the relative incidence of themes and topics arising from the data, across the system and among its component mechanisms, we also identify thematic trends in the UN human rights system. We can thus empirically assess which rights draw more institutional attention, which rights are less prominent, which rights are located at the system's center and which rights are at its margins.

Our research presents several findings relating to the density of UN human rights discourse and the implications of these findings on the major debates surrounding the field of UN human rights. *First*, we identify 60 themes and topics of discussion that together form the UN human rights discourse. The main thematic clusters include: sex-and-gender related topics; migration themes; socio-economic issues; civil and political issue; war, terror and military cluster; minority, ethnicity and race themes; and institutional topics. Moreover, our methodology is validated by finding strong correlations between the mandates of TBs and SPs and their dominant topics, whereas UPR recommendations tend to be much more diffuse, reflecting the latter's open-ended mandate. *Second*, we find that over time, while a small number of topics lose weight in the discourse, a bigger number of topics increase in prevalence, indicating that overall the discourse in the UN human rights system has become denser. *Third*, we find that UN documents, on average, deal with more human rights topics with every passing year, and that more human rights mechanisms discuss and make more recommendations with respect to more topics. *Fourth*, we identify several local patterns that merit further investigation: (1) a significant rise in references to disability rights on the one hand and to business and human rights on the other hand. (2) A collective decrease in the discursive attention given to war and terror themes over the past 15 years. (3) A 'Conservation of Energy' pattern among topics relating sex and gender, where an increased attention to one aspect of this cluster is counterbalanced by a decreased discursive energy dedicated to another aspect of the cluster.

⁷ Alschner, 'The Computational Analysis of International Law' in Deplano and Tsagourias (eds), *Research Methods in International Law: A Handbook*, (2021) 203.

⁸ Panagis and Christensen, 'On Top of Topics: Leveraging Topic-modeling to Study the Dynamic Caselaw of International Courts' in Bex and Villata (eds), *Legal Knowledge and Information Systems: JURIX* (2016) 53; Keydar, 'Mass Atrocity, Mass Testimony, and the Quantitative Turn in International Law' (2019) 53 *Law and Society Review* 317 at 554.

Taken together, our findings from the novel theoretical and methodological model of density, make contributions to the two levels of analysis of the UN human rights system and the corresponding debates and critiques: On the *material* level, we find that there indeed exists a proliferation of topics discussed by the system over time. Both, diachronically, with more topics gaining prevalence throughout the 15 years span of our study, as well as synchronically with more topics increasingly discussed both in more documents and in more mechanisms. On the *organizational* level, we find that certain popular topics like human rights and business, as well as disability, are discussed by more bodies, crossing institutional spheres of influence and structural mandates of operation, whereas other topics such as trafficking are becoming less prevalent, and lose attention even by the bodies mandated to protect related rights. This might show that the system is not necessarily optimizing its already very limited resources in order to protect human rights, and whereas some subjects might get increased attention from many bodies, others tend to be put aside.

2. CONTEMPORARY CRITIQUES OF THE UN HUMAN RIGHTS SYSTEM

Since its establishment following the horrors and atrocities of the Second World War, the UN has been historically the flagship of international human rights. Human rights are mentioned in the preamble of the UN Charter,⁹ as well as in Articles 1, 13(1), 55, 56, 62 and 68. Currently, it is customary to divide the UN human rights monitoring mechanisms into two types. The first is treaty base mechanisms, and the second is Charter based mechanisms.¹⁰ The treaty based mechanisms, as its name suggests, includes nine treaty bodies (TBs) established in order to monitor the implementation of the nine UN human rights treaties.¹¹ These include, among others, the UN Human Rights Committee (responsible for the implementation of the International Covenant on Civil and Political Rights), the Committee against Torture (responsible for the implementation of the Convention against Torture), and the Committee on the Elimination of Discrimination against Women (responsible for the implementation of the Convention on the Elimination of All Forms of Discrimination Against Women). The UN treaty bodies are comprised of non-political bodies of independent experts in international human rights law. One of the three roles of these bodies is to submit reports on the status of the implementation of the treaty by member states.

On the other hand, charter-based mechanisms are mainly under the auspices of the UN Human Rights Council (HRC or the Council). These mechanisms include the Special Procedures, the Universal Periodic Review (UPR), and the independent investigations. The Council is a political-diplomatic forum that aims to bring ‘constructive international dialogue’ on human rights.¹² Given its political nature, it is inherently different from the more expert-based professional TBs. The Council consists of 47 member states, elected for three year terms. One of the main functions of the Council, is conducting the UPR. Under the UPR, the human rights

⁹ Charter of the United Nations 1945.

¹⁰ OHCHR website, Instruments and Mechanisms, Available at: www.ohchr.org/en/instruments-and-mechanisms#:~:text=The%20ten%20human%20rights%20Treaty,Periodic%20Review%20and%20Independent%20Investigations [last accessed 20 June 2024].

¹¹ These treaties are the International Convention on the Elimination of All Forms of Racial Discrimination 1966, 660 UNTS 1; International Covenant on Civil and Political Rights 1966, 999 UNTS 171; International Covenant on Economic, Social and Cultural Rights 1966, 993 UNTS 3; Convention on the Elimination of All Forms of Discrimination against Women 1979, 1249 UNTS 1; Convention against Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment 1984, 1465 UNTS 85; Convention on the Rights of the Child 1989, 1577 UNTS 3; International Convention on the Protection of the Rights of All Migrant Workers and Members of Their Families 1990, 2220 UNTS 3; International Convention for the Protection of All Persons from Enforced Disappearance 2006, 2716 UNTS 3; Convention on the Rights of Persons with Disabilities 2006, 2518 UNTS 283 (Hereinafter CRPD).

¹² GA Res 60/251, 15 March 2006, A/RES/60/251 at para 4.

situation in every state is ‘peer’-reviewed by other UN member states. At the end of the review, the members of the Council issue a report of the human rights situation in the country. The review is not limited to specific treaties or subject matters. Finally, the special procedures are independent human rights experts commissioned by the Council to report and advise on human rights from a thematic or country-specific perspective. There are currently 45 thematic and 13 country mandates.¹³

Even though the UN has worked tirelessly in different ways to promote human rights, it has also faced multiple criticisms for its activities in this field. Among the many criticisms of the UN human rights system one can mention using human rights discourse for political purposes; proliferation of norms and institutions, and over-focusing on specific human rights.¹⁴ We shall now discuss two of these criticisms in more detail - the puzzle of proliferation and structural problems.

A. The Puzzle of Proliferation

Although there is a wide agreement on the existence of human rights proliferation, there is no agreed definition of what proliferation actually is. Rather, authors use different characterizations that are often context-specific. Such definitions usually refer either to proliferation’s institutional dimension (i.e. the growing *number* of human rights institutions), or to its substantive dimension (i.e. the growing *number* and *scope* of rights)—all in a *linear* sense.¹⁵ Although there has been much debate on the extent of the proliferation phenomena, the more institutional dimension of proliferation is uncontested: the number of human rights mechanisms has indeed grown over time. If in 1980 there were only a handful of UN-based human rights mechanisms, the UHRI now covers over 60 of them.

The phenomenon of human rights proliferation has brought upon itself a fair amount of criticism, but we will briefly mention only a small share of it. For instance, Clément argues that the ‘popularization of [human rights] as a vernacular for framing grievances has resulted in ‘rights inflation.’¹⁶ This, among others, can also create an unwanted ‘hierarchy’ of human rights, anathema to the very idea of foundational moral claims.¹⁷ Furthermore, it has been argued that a ‘forest’ of rights and human rights bodies allows states with problematic records to divert attention from their violations of more fundamental rights by shifting the focus to more specific HRs, for example, through the UN HRC’s Special Procedures mandates.¹⁸ This may be done by supporting establishment of mechanisms on relatively specialized thematic issues, where a state

¹³ OHCHR website, Special Procedures, available at: www.ohchr.org/en/special-procedures-human-rights-council [last accessed 20 June 2024].

¹⁴ Edwards et al., Allen, Scott and Irvine: ‘Sins of Commission? Understanding Membership Patterns on the UN Human Rights Commission’ (2008) 61 *Political Research Quarterly* 390; Ghanea, ‘From UN Commission on Human Rights to UN Human Rights Council: One Step Forwards or Two Steps Sideways?’ (2006) 55 *The International and Comparative Law Quarterly* 695, at 697; Seligman, ‘Politics and Principle at the UN Human Rights Commission and Council (1992–2008)’ (2011) 17 *Israel Affairs* 520, at 520; Besant and Malo, ‘Dim Prospects for the UN Human Rights Council’ (2009) 2 *Yale Journal of International Affairs* 144 at 145; Hug, ‘Dealing with Human Rights in International Organizations’ (2016) 15 *Journal of Human Rights* 21; Hug and Lukács, ‘Preferences or Blocs? Voting in the UN Human Rights Council’ (2013) 9 *The Review of International Organizations* 83; Terman and Voeten, ‘The Relational Politics of Shame: Evidence from the Universal Periodic Review’ (2018) 13 *The Review of International Organizations* 1.

¹⁵ Freedman and Mchangama, ‘Expanding or Diluting Human Rights? The Proliferation of UN Special Procedures Mandates’ (2016) 38 *Human Rights Quarterly* 164 (emphasis added).

¹⁶ Clément, ‘Human Rights or Social Justice? The Problem of Rights Inflation’ (2017) 22 *The International Journal of Human Rights* 155; For criticisms of human rights proliferation, see, Bilder, ‘Rethinking International Human Rights: Some Basic Questions’ (1969) 1 *Wisconsin Law Review* 171; Alston, ‘Conjuring up New Human Rights: A Proposal for Quality Control’ (1984) 78 *The American Journal of International Law* 607–621; McCall-Smith, ‘The Proliferation of Human Rights: Between Devotion and Calculation’ in Wouters et al., (eds), *Can We Still Afford Human Rights? Critical Reflections on Universality, Proliferation and Costs*, (2020) 114 at 114–142; Theilen, ‘The Inflation of Human Rights: A Deconstruction’ (2021) 34 *Leiden Journal of International Law* 831; Winkler, ‘The Human Right to Sanitation’ (2016) 37 *University of Pennsylvania Journal of International Law* 1331 at 1362–1378; Posner, *The Twilight of Human Rights* (2014).

¹⁷ Clément, *supra* n 16 at 156.

¹⁸ Freedman and Mchangama, *supra* n 15.

has a better record. Finally, an additional critique is that over-interpretation of human rights treaties by the various UN mechanisms may lead them to act ultra vires—beyond the authority given to them—creating at least a perception of violating the sovereignty of the mandate-givers, undermining their legitimacy and justifying resistance.¹⁹

Much has been written about human rights proliferation, serving as a lightning-rod for critique and concern. However, there has been no systematic, comprehensive empirical research of international human rights proliferation in practice, and of the spatial forms that it takes. Empirical research so far has amounted to simple tallying of human rights and human rights institutions.²⁰ This is unsatisfactory regarding a phenomenon that raises such uncertainties and questions.

Lastly, another angle of the proliferation debate concerns the question of intersectionality. Intersectionality refers to the complex ways in which social identities overlap and, in negative scenarios, can create compounding experiences of discrimination and concurrent forms of oppression.²¹ It raises both substantial as well as organizational challenges. In recent years, intersectionality claims have gained much popularity in the human rights world.²² It is argued that intersectionality ‘has become the standard multi-disciplinary approach “for analyzing subjects” experiences of both identity and oppression’.²³ In the human rights world, the UN treaty bodies system influenced very much intersectionality when it analyzed human rights violations from several perspective—for instance, the Convention on Elimination of Discrimination against Women (CEDAW) Committee discussed how gender discrimination is intertwined with race discrimination in the context of women belonging to minority groups.²⁴ The same is true also for the UN Human Rights Committee (which is in charge of the implementation of the International Covenant on Civil and Political Rights), and the Committee against Racial Discrimination (CERD).²⁵ Also, new human rights treaties, such as the Convention on the Rights of Persons with Disability, recognize in their content intersectionality’s such as special vulnerability of women, children and minorities with disabilities.²⁶ Much like the criticisms sounded in the broader discussion of proliferation, the concept of intersectionality has been widely challenged, *inter alia*, for leading to a fragmented rather than a coherent view of individuals,²⁷ as well as due to the infeasibility in addressing all variety of intersectional identities.²⁸

¹⁹ Upendra Baxi, *The Future of Human Rights* (2008) at 96.

²⁰ Posner, *supra* n 16 at 151–163.

²¹ The United Nations Network on Racial Discrimination and Protection of Minorities, ‘Guidance Note on Intersectionality, Racial Discrimination & Protection of Minorities’, 22 September 2022, available at: www.ohchr.org/sites/default/files/documents/issues/minorities/30th-anniversary/2022-09-22/GuidanceNoteonIntersectionality.pdf [last accessed 20 June 2024].

²² Davis, ‘Intersectionality and Feminist Politics’ (2006) 13 *European journal of women's studies* 194; Beco, ‘Protecting the Invisible: An Intersectional Approach to International Human Rights Law’ (2017) 17 *Human Rights Law Review* 633; See also Taefi, ‘The Synthesis of Age and Gender: Intersectionality, International Human Rights Law and the Marginalisation of the Girl-Child’ (2009) 17 *The International journal of Children's Rights* 345; Bond, ‘International Intersectionality: A Theoretical and Pragmatic Exploration of Women's International Human Rights Violations’ (2003) 52 *Emory Law Journal* 71; Gerken, ‘Second-Order Diversity’ (2004) 118 *Harvard Law Review* 1099.

²³ Chow, ‘Has Intersectionality Reached Its Limits: Intersectionality in the UN Human Rights Treaty Body Practice and the Issue of Ambivalence’ (2016) 16 *The Human Rights Law Review* 453 at 454.

²⁴ Ibid. at 454; See also Convention on the Elimination of All Forms of Discrimination against Women, General Recommendation No 28: The core obligations of State Parties under Article 2 of the Convention on the Elimination of All Forms of Discrimination against Women, CEDAW/C/GC/28, 16 December 2010, at para 18, available at: www.refworld.org/docid/4d467ea72.html [last accessed 20 June 2024]

²⁵ Chow, *supra* n 23 at 465–472.

²⁶ Beco, *supra* n 22 at 641.

²⁷ Fuss, *Essentially Speaking: Feminism, Nature and Difference* (1989) at 103; Levit, ‘Introduction: Theorizing the Connections among Systems of Subordination’ (2002) 71 *University of Missouri Kansas City Law Review* 227; Chow, *Supra* n 23 at 472–474.

²⁸ Ibid.

B. Structural Problems in the UN Human Rights System

The extensive debate about proliferation (and intersectionality) raises a second—organizational-structural—matter regarding the overlaps, gaps, over and under-emphasis of different mechanisms and bodies. On the one hand overlapping mandates between the different mechanisms of the UN perhaps guarantee a more holistic approach to address the intersectionality debate. On the other hand, such overlap deepens the problem of proliferation, both of norms but also of mechanisms, resulting in waste of resources, from money and time to attention as many mechanisms devote attention to a small number of ‘hot’ topics while neglecting others.

One of the phenomena surrounding the abovementioned proliferation of human rights is that it can, on the one hand, create overlaps and over-emphases of different human rights subjects, and on the other hand, leave certain subjects underemphasized (or not covered at all).²⁹ Among others, it has been argued that human rights mechanisms and bureaucracies are themselves parts of the human rights crisis.³⁰ For instance, the UN has appointed a Special Rapporteur on the Rights of Persons with Disabilities,³¹ as well as a treaty body in charge of implementing the Convention on the Rights of People with Disability.³² Obviously, there is a lot of overlap between the mandates of these two mechanisms. Another example is the subject of protecting women belonging to minority groups. This subject can be relevant both to the CEDAW Committee, as well as to the CERD Committee, raising concerns regarding the organizational capacity to accommodate issues of intersectionality. Moreover, some treaty bodies tend to interpret their mandate more extensively—for instance, in its General Comment Number 36, the UN Human Rights Committee interpreted the right to life (based upon Article 6 of the International Covenant on Civil and Political Rights), as including the right to food, water, shelter and healthcare.³³ These rights are traditionally seen as positive rights, and protected by a different UN treaty—the International Covenant on Social Economic and Cultural Rights.³⁴ On the other hand, there are certain subjects (which might be important), but are left behind for different reasons, or ‘fall out of favor’ from the general discourse. One can mention, for instance, the right to be recognized as a person before the law.³⁵ Specifically, the overlap has the potential to cause many problems, such as contradictory interpretation of human rights norms. This can be used as an excuse for states not to comply with their human rights responsibilities at all.³⁶ Moreover, it can be argued that the overlap creates a burden for states regarding their reporting requirements to the different treaty bodies.³⁷ Also, a situation

²⁹ For example, See Bayefsky, *The UN Human Rights Treaty System: Universality at the Crossroads* (2001) at 57, 116, 173.

³⁰ Kennedy, ‘International Human Rights Movement: Part of the Problem?’ (2002) 15 *Harvard Human Rights Journal* 101 at 119–20.

³¹ Lhotsky, ‘Human Rights Treaty Body Review 2020—Towards an Integrated Treaty Body System’, *Global Campus Europe*, 2017, available at: repository.ghumanrights.org/items/7a9a9bc7-4df4-4238-93fa-49dde51765e5 [last accessed 20 June 2024]; UN Treaty Bodies Announce New Measures to Synchronize Their Work, International Justice Resource Center, 11 June 2019, available at: ijrcenter.org/2019/07/11/UN-treaty-bodies-announce-new-measures-to-synchronize-their-work/ [last accessed 20 June 2024]; Current and former mandate holders (existing mandates), UN website, 1 October 2022, available at: www.ohchr.org/en/special-procedures-human-rights-council/current-and-former-mandate-holders-existing-mandates [last accessed 20 June 2024].

³² CRPD, *supra* n 11.

³³ UN Human Rights Committee, *General comment No. 36—Article 6: The Rights to Life*, UN CCPR/C/GC/36, 3 September 2019, at para 26, available at: documents.un.org/doc/undoc/gen/g19/261/15/pdf/g1926115.pdf?token=UIWHNAbcMx8n5jBzcc&fe=true [last accessed 20 June 2024].

³⁴ International Covenant on Economic, Social and Cultural Rights 1966, 993 UNTS 3.

³⁵ International Covenant on Civil and Political Rights 1966, 999 UNTS 171 at Article 16.

³⁶ Tasioulas, ‘Saving Human Rights from Human Rights Law’ (2019) 52 *Vanderbilt Journal of Transnational Law* 1167 at 1191–1192; Koskeniemi and Leino, ‘Fragmentation of International Law? Postmodern Anxieties’ (2002) 15 *Leiden Journal of International Law* 553; Shlomo-Agon, ‘Farewell to the F-Word? Fragmentation of International Law in Times of the COVID-19 Pandemic’ (2021) 72 *University of Toronto Law Journal* 1.

³⁷ For example, See Pillay, ‘Treaty Bodies—No more tinkering: real reform needed to UN human rights treaty monitoring’, International service of Human Rights, 18 October 2019, available at: ishr.ch/latest-updates/treaty-bodies-no-more-tinkering-real-reform-needed-to-UN-human-rights-treaty-monitoring/ [last accessed 20 June 2024].

in which all the mechanisms are dealing with ‘fashionable’ subjects, while neglecting others, is obviously very undesirable as well.

Finally, the institutional aspects of the problem is of special importance because the United Nations human rights mechanisms constantly struggle with lack of funds and resources.³⁸ This financial struggle limits the scope of work that the different treaty bodies can undertake.³⁹ This may increase the need to have more clarity both regarding the specific topics that each mechanism deals with, and puts a question mark regarding the benefits of having so many mechanisms.

3. COMPUTATIONAL ANALYSIS OF HUMAN RIGHTS LAW

Empirical legal scholars have traditionally relied on manual content analysis, where they read and coded individual documents based on predefined themes.⁴⁰ This method, however, is limited by its impracticality for large corpora, difficulty in maintaining intercoder reliability for complex research questions, and inherent concerns about coding reliability.⁴¹ Consequently, researchers are often forced to choose between large-scale studies with superficial observations and smaller-scale studies with deeper, more nuanced coding. This trade-off limits the ability to comprehensively understand legal phenomena.⁴² An alternative approach involves using computer programs to search for keywords in texts, which also has its limitations. It requires predefined exploration scopes and assumes a fixed, non-contextual meaning for each term.

The advent of machine learning (ML) and natural language processing (NLP) has provided new opportunities for legal text analysis at scale.⁴³ Improved datasets, faster computers, and advanced text analysis techniques enable scholars to apply statistical methods directly to legal texts, shifting the bottleneck from access and coding to theory, methodology, and software.⁴⁴ Topic modeling, an unsupervised ML technique, has gained popularity in empirical legal studies. It divides large textual corpora into groups of words with similar semantic structures, called ‘topics’.⁴⁵ Statistically, each topic encompasses all the words in the corpus, but those are weighted differently for each topic by the likelihood of these terms to appear together, in a manner that a human domain expert would associate with the same theme.⁴⁶ Topic modeling offers a fresh approach to traditional qualitative analysis by eliminating preconceived notions about topics, leading to a more objective data analysis. This method reverses the conventional research process by using machine learning to initially identify and track topics within the text corpus. Human expertise is then employed to interpret and contextualize the results.⁴⁷ This technique enables the classification of vast amounts of data into semantically similar clusters

³⁸ Strengthening and enhancing the effective functioning of the human rights treaty body system 2014, GA A/RES/68/268.

³⁹ For instance, recently due to lack of resources, the UN Committee on the Rights of the Child had to cancel its pre-session in Geneva, due to lack of financial liquidity caused by member states not complying with their financial commitments. See www.linkedin.com/feed/update/urn:li:activity:7180181597898313728/ [last accessed 3 April, 2024].

⁴⁰ Keydar, ‘Listening from Afar: An Algorithmic Analysis of Testimonies from the International Criminal Courts’ (2020) 1 *Illinois Journal of Law, Technology & Policy* 55.

⁴¹ Evans et al. ‘Recounting the Courts? Applying Automated Content Analysis to Enhance Empirical Legal Research’ (2007) 4(4) *Journal of Empirical Legal Studies* 1007.

⁴² Keydar, *supra* n 40.

⁴³ Livermore and Rockmore (eds), *Law as Data: Computation, Text & the Future of Legal Analysis* (2019); Choi, ‘Legal Analysis, Policy Analysis, and the Price of Deference: An Empirical Study of Mayo and Chevron’ (2021) 38 *Yale Journal on Regulation* 2.

⁴⁴ Livermore, Riddell and Rockmore, ‘The Supreme Court and the Judicial Genre’ (2017) 59 *Arizona Law Review* 837.

⁴⁵ Blei, Ng and Jordan, ‘Latent Dirichlet Allocation’ (2003) 3 *Journal of Machine Learning Research* 993; Blei, ‘Probabilistic Topic Models’ (2012) 55(4) *Communications of the ACM* 77.

⁴⁶ DiMaggio, Nag and Blei, ‘Exploiting Affinities between Topic Modeling and the Sociological Perspective on Culture: Application to Newspaper Coverage of U.S. Government Arts Funding’ (2013) 41 *Poetics* 570.

⁴⁷ Ruhl, Nay and Gilligan, ‘Topic Modeling the President: Conventional and Computational Methods’ (2018) 86(101) *George Washington Law Review* 1243.

without human intervention and without reducing the documents to binary or numerical representations.⁴⁸

In contrast, traditional methods often limit researchers' understanding of legal phenomena due to the trade-off between the breadth and depth of analysis. These approaches also presume that researchers know what they are looking for before analyzing the texts. For instance, keyword search strategies require researchers to define the scope of exploration beforehand and assume a fixed meaning for each term, ignoring contextual or relational nuances. With topic modeling, however, the computational model is free from such preconceptions. The topics are determined by the unsupervised model, and only then can researchers examine the data in relation to existing literature, such as human rights, allowing for a more nuanced and comprehensive understanding.⁴⁹ Legal scholars have employed topic modeling to map patterns across various legal documents, such as U.S. Supreme Court judgments,⁵⁰ Appellate Court decisions,⁵¹ Presidential directives,⁵² and constitutions.⁵³ This methodology has also been insightful in analyzing judicial transcripts and testimonies,⁵⁴ as well as cross-referencing in UN Security Council Resolutions.⁵⁵ Beyond organizing and categorizing, topic models can help researchers conceptualize law and legal institutions, providing a comprehensive 'bird's eye-view' of legal corpora.⁵⁶

Following the discussion of topic modeling, it is worth noting that the UHRI corpus, comprising 180,000 recommendations, presents both an opportunity and a challenge for researchers. This vast database is a treasure trove for exploring various facets of UN human rights work. However, analyzing such a massive amount of information poses significant challenges in terms of resources and the risk of biased cherry-picking. In this context, NLP techniques emerge as an invaluable tool. It enables the efficient analysis of the UHRI corpus with realistic resources while ensuring that all information in the database is considered. This comprehensive approach significantly reduces the risk of biases, allowing researchers to maximize the benefits of this extensive database.

4. DATA AND MODELING

A. The UHRI Database as a Source for Assessing the UN Human Rights System

The UHRI is an online dataset hosted by the UN Office of High Commissioner on Human Rights.⁵⁷ It contains both individual recommendations and full documents from the UN human rights TBs, the HRC SPs and the HRC UPR, covering 55 UN human rights mechanisms. As mentioned in part 2 above, the UN TBs are non-political bodies of independent experts, created by the ten core UN human rights treaties in order to monitor the implementation of those

⁴⁸ Law, 'The Global Language of Human Rights: A Computational Linguistic Analysis' (2018) 12(1) *Law Ethics and Human Rights* 111.

⁴⁹ Keydar, *supra* n 40.

⁵⁰ Livermore et. al, *supra* n 44.

⁵¹ Oldfather, Bockhorst and Dimmer, 'Triangulating Judicial Responsiveness: Automated Content Analysis, Judicial Opinions, and the Methodology of Legal Scholarship' (2012) 64 *Florida Law Revie* 1189.

⁵² Ruhl, Nay, and Gilligan, *supra* n 47.

⁵³ Law, *supra* n 48.

⁵⁴ Keydar et al. 'Modeling Repressive Policing: Computational Analysis of Protocols from the Israeli State Commission of Inquiry into the October 2000 Events' (2021) *Law and Society Inquiry* 1, available at: www.cambridge.org/core/journals/law-and-social-inquiry/article/abs/modeling-repressive-policing-computational-analysis-of-protocols-from-the-israeli-state-commission-of-inquiry-into-the-october-2000-events/CB826712BCF93FFA27D54417F00E1C7 [last accessed 15 January 2022]; Keydar, 'Changing the Lens on Survivor Testimony: Topic Modeling the Eichmann Trial' (2022) 29 *Jewish Studies Quarterly* 412.

⁵⁵ Ridi and Gasbarri, 'The Role of Previous Resolutions in the Practice of the Security Council', 2022, available at: papers.ssrn.com/sol3/papers.cfm?abstract_id=4123116 [last accessed 20 June 2024].

⁵⁶ Keydar et al., *supra* n 54.

⁵⁷ The Universal Human Rights Index (UHRI)), available at: uhri.ohchr.org/en/search-human-rights-recommendations [last accessed 3 February 2023].

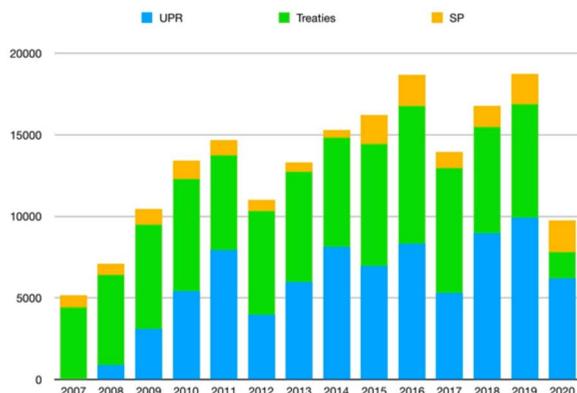


Figure 1. Composition of the UHRI corpus based on number of recommendations per mechanism per year.

treaties by member states. One of the three roles of these bodies is to submit reports on the status of the implementation of the treaty by member states. The SPs are independent human rights experts commissioned by the UN HRC to report and advise on human rights from a thematic or country-specific perspective. As mentioned above, there are currently 45 thematic and 13 country mandates. The UPR is a state-driven process conducted before the UN HRC. Under the UPR, the human rights situation in every state is ‘peer’-reviewed by other UN member states. At the end of the review, the members of the HRC issue a report of the human rights situation in the country. The review is not limited to specific treaties or subject matters. The first UPR review cycle began in April 2008⁵⁸ therefore, in Figure 1, which displays the composition of the UHRI corpus—the number of recommendations per mechanism per year, there are no UPR documents in 2007, and then a certain increase of documents starting in 2008. The difference in the number of documents over the years might be attributed to the identity of the states being reviewed in each year—although the number of states reviewed in each session is the same, some states might attract more criticism than others.

Taken together, these three groups of mechanisms and the UHRI corpus, present an unparalleled opportunity to understand the patterns of UN human rights discourse. Topic modeling may help us understand the documents in several ways. First, regarding the UPR, which is not limited by subject matters, it can illuminate pattern changes regarding the review of different human rights, and how the focus of review changed over time. Regarding the TBs and SPs, whose mandates pertain to defined human rights issue-areas, we may understand how significant are the subject matters entrusted to each mechanism in their documents (for instance, is torture indeed the central topic dealt with by the Committee against Torture (CAT)?). It can also show us what additional themes are central to the work on those bodies, and how those patterns changed over time.

B. The Density of Discourse Model

In this study, we utilize the strengths of topic modeling techniques to operationalize the concept of *Density* in relation to the discourse within UN human rights mechanisms. We contend that understanding the dynamics of discourse in the human rights system, including identifying focal

⁵⁸ Universal Periodic Review, UN Human Rights Council website, available at: www.ohchr.org/en/hrbodies/upr/pages/uprmain.aspx [last accessed 3 February 2023].

areas of rights and those that are overlooked, requires an empirical examination of the structures and dynamic patterns of discourse in UN institutions. Addressing the critiques of the UN human rights discourse outlined earlier necessitates an empirical account of the themes and topics that engage the attention of various stakeholders in the human rights system. To this end, we introduce a novel model, *Density of Discourse*, to assess the evolving trends in the discourse of rights within the UN human rights ecosystem.

In general, *density* tracks quantities per unit volume, unit area, or unit length, measuring degrees of compactness, consistency or concentration in a given (often spatial) unit.⁵⁹ Conceptually, we borrow the term from the field of demography—the statistical study of populations—where population density refers to the number of individuals per unit area or volume. For example, in the State of New York there are approximately 20 million people, of whom 1.6 million reside in Manhattan alone. This is an important but limited perspective on the State and the city. When adding information on the density of population, we learn that while the average population density in the State of NY is relatively low (420 people per sq. ml.), in Manhattan population density is almost 70,000 people per sq. ml. Density tells us not only how many people live in NYC but where they concentrate, where are the hot spots of activity (during the day or at night), where do people tend to go, which areas are more abandoned or exclusive. It is not only a spatial and physical account, but also a social and political characterization of city life. Measuring density provides crucial information for understanding the demographic system's inner structure and dynamics of temporal development, with policy implications. During the COVID-19 pandemic, urban population density as a major catalyst for the spread of the coronavirus was intensively studied, even focusing on a higher resolution of 'crowding' in ZIP code areas and subway ridership.⁶⁰ Significantly for our analogy, spatial demographic analysis has shown important trends in human migration patterns caused by the pandemic, not least in New York.⁶¹

In our research, we utilize the concept of density to quantify and analyze the patterns of attention within the UN human rights discourse. We aim to assess the 'thickness' or 'thinness' of discussions on various human rights issues, analogous to measuring population density in a geographic area. This approach allows us to identify which human rights topics are densely discussed, indicating high engagement and concern, and which areas are sparsely covered, signalling potential neglect in the human rights agenda.

The density analogy extends to comparing the spatial concentration of populations with the concentration of discourse on specific human rights issues within UN mechanisms. Similar to how demographers use population density to understand resource allocation, we use density to examine the 'crowdedness' of discussions around human rights topics. This method helps us map the landscape of human rights discourse, pinpointing areas of intense dialogue and attention ('hotspots') as well as neglected topics ('deserted' areas) that may require increased focus and advocacy. By applying the density concept, we introduce a quantitative dimension to the analysis, allowing us to measure the relative 'weight' or 'volume' of discourse on different human rights issues. This enables us to assess the prominence and intensity of topics within the discourse, aiding in the identification of priorities, trends, and potential blind spots in the UN human rights system. Ultimately, the use of density in our research provides a tool for dissecting

⁵⁹ Barak, Sommer and Mualem, 'Urban Attributes and the Spread of COVID-19: The Effects of Density, Compliance and Socio-Political Factors in Israel' (2021) 1 *Science of the Total Environment* 793.

⁶⁰ Hamidi and Hamidi, 'Subway Ridership, Crowding, or Population Density: Determinants of COVID-19 Infection Rates in New York City' (2021) 60 *American Journal of Preventive Medicine* 614.

⁶¹ New York City Comptroller Scott M. Stringer, *The Pandemic's Impact on NYC Migration Patterns* November 2021, available at: comptroller.nyc.gov/wp-content/uploads/documents/The-Pandemics-Impact-on-NYC-Migration-Patterns.pdf [last accessed 20 June 2024].

and interpreting the complex landscape of human rights discourse, offering insights into the distribution of attention and resources within the global human rights framework.

We first conduct a corpus-level analysis which identifies the main topics comprising the UHRI corpus. After mapping the overall composition of the UHRI corpus, at the second stage, we trace discursive patterns across the UN human rights system and over the timeframe covered in the database. For the Density of Discourse model, we combine our metadata on the documents to construct topic distribution between years and among mechanisms, discerning synchronic and diachronic trends in topics between years and mechanisms to map the dynamic shifts in the discourse of human rights.

When considered together, the diachronic and synchronic changes can be applied to measure the density of the comprehensive closed system offered by the UHRI (a given number of mechanisms, documents, and topics) that serves as a useful proxy for assessing claims of changes in the density of international human rights at large. Thus, like measuring the density in any two-dimensional system, using the results of the density we may calculate the system's density vis-à-vis two axes: documents and mechanisms.

The first axis is the number of documents by year, normalizing for comparable density of topics per document, across time (Equation I).

$$\text{Density}(\text{Documents of year}(i)) = \frac{\sum_{x=1}^N \text{Number of topics per document in year}(i)}{\text{Number of Documents in a year}(i)} \quad (1)$$

The second axis is the human rights mechanisms themselves, measuring density of each topic across the UN human rights system (Equation II).

$$\text{Density}(\text{Mechanisms of year}(i)) = \frac{\sum_{x=1}^N \text{Number of topics per mechanism in year}(i)}{\text{Number of mechanisms in a year}(i)} \quad (2)$$

The *Density of Discourse model* offers a comprehensive framework for dynamically mapping the thematic composition of any corpus within a specific discursive field, such as the UN human rights system. By examining patterns both diachronically, as the system evolves over time, and synchronically, by tracing the activities of various mechanisms within each year, the model enables a nuanced understanding of the shifting focus within the human rights discourse. This analysis allows us to pinpoint which human rights issues are at the forefront of institutional attention and which remain on the periphery, providing valuable insights into the priorities and challenges within the UN human rights ecosystem. By applying the *Density of Discourse* model, we can effectively navigate the complex landscape of human rights discourse, identifying areas for further research and advocacy to ensure a more balanced and comprehensive approach to human rights protection and promotion.

5. MONITORING THE UN HUMAN RIGHTS DISCOURSE

A. Revealing the Topical Composition of the UN Human Rights Discourse

We begin with a corpus-level analysis which will help identify the main topics comprising the UHRI corpus, using Latent Dirichlet Allocation (LDA) which is considered the standard topic modeling algorithm.⁶² We pulled all the documents in the UHRI database using its API. We organized the documents similarly to the UHRI catalogue, with each document in the corpus

⁶² Blei, Ng and Jordan, *supra* n 45; We use an implementation of LDA using Gensim, see at: radimrehurek.com/gensim/ [last accessed 20 June 2024].

an official document by a UN mechanism regarding a specific country. This yielded a corpus that contains 2895 different documents and consists of about 180,000 recommendations.

To train the LDA model, we first pre-processed the documents, creating a list of words for each document.⁶³ We filtered out words that occur in fewer than fifty documents, or in more than eighty percent of the documents. We took a mixed approach to determine the optimal number of topics, which was ultimately set on sixty.⁶⁴

Table A shows the sixty topics, each represented by its ten most prominent words. Topic names were added by the authors, as explained below.

As can be gleaned from **Table A**, some of the topics lent themselves to interpretative naming. For example, topic 0 includes words such as *truth, reparation, reconciliation, and conflict* and was hence named ‘transitional justice’; topic 53, comprising of the terms *displaced, internally, humanitarian and camp*, all relating to the selected name ‘internally displaced persons.’ In a deliberate effort to reduce interpretative interpolation, whenever suitable, topic names were drawn from the top terms in the word cluster.

While most topics necessitated minimal interpretation, some were less straight-forward and required more extensive domain expertise. For example, topic 19, which includes words such as *province, provincial, tribal, regulation and jurisdiction* was named ‘indigenous – regulation,’ based on our interpretive understanding of the shared context. Similarly, topic 39 consists of terms that seem semantically unrelated: *disability, school, abuse, age, adolescence, sexual and juvenile*. After deliberations, we settled on naming it ‘juvenile.’ Topic 39 demonstrates the limits of topic modeling, whose explanatory power derives from statistical analysis coupled with human expertise. It also exemplifies a key advantage of this approach. Unlike empirical methods that rely on human coding to translate natural language into annotation schemas, topic modeling retains the original text, contributing to the transparency and validity of the interpretive process. To further enhance the validity of our interpretative process, each of the authors named each topic independently, based on the word lists. We then compared our topic names and arrived at shared designations. All sixty topics were named in this fashion, as we constructed—topic by topic—the thematic semantic universe of the UHRI corpus.

Examining the output of the model, we can trace common traits among the sixty topics. Some deal with civil and political rights—such as topics 12 (Freedom of religion), 25 (Freedom of assembly), and 32 (Freedom of speech). Others deal with socio-economic conditions—such as topics 13 (Poverty—housing and income), 20 (Health), and 21 (Education) or focus on various protected groups—such as topics 18 (Race-African descent), 26 (Prisoners) and 41 (Disability). Moreover, we identify groups or clusters of substantively related topics within the model’s output. Topics 10 (Criminal procedure and due process), 11 (Judiciary), 34 (Judiciary independence), and 54 (Legislative), for example, form a cluster relating to the legal system.⁶⁵ The model’s power is that its results—the generated sixty topics—serve as the empirical basis for any subsequent interpretative process, and are not affected by it.

From the corpus-level topic modeling we formulated a topic outlay for each *document* in the corpus, computing the topics that comprise it. To illustrate, document A/HRC/12/34/ADD.2

⁶³ Pre-processing included removing punctuation, numbers and one-character words, lower-casing, tokenizing and removing stop-words, names of countries and nationalities, language codes and other technical terms related to the administrative work of the UN.

⁶⁴ In a process of trial-and-error we set the following training parameters: chunk size = 2000 passes = 20 iterations = 400. We used a coherence test to find the local maximum points in the function between 2 and 80 topics. Then, the authors as domain experts examined the topics and elected to use a 60-topic model. A detailed description of the cleaning and tokenising process can be found in Appendix 1. Also, the code and the raw material can be accessed via the following link: https://github.com/DHHuji/density_of_discourse_HR/tree/main.

⁶⁵ Other dominant clusters concern military and war-related terms, with topics 2 (Use of military force), 3 (Terrorism), 24 (Armed conflict), 51 (Armed conflict-child soldiers), and migrants and refugees, with topics 5 (Labor-migrants), 6 (Migrant workers-trafficking), 7 (Migrant workers-civil and social rights), 8 (Refugees and asylum seekers).

Table A. List of 60 topics, each represented by its 10 most prominent words. Names of topics added by the authors

Topic #	Topic name	Topic Terms	Topic #	Topic name	Topic Terms	Topic #	Topic name	Topic Terms
0	Transitional Justice	truth, reparation, violation, commission, crime, reconciliation, conflict, armed, investigation, past nuclear, disaster, earthquake, accident, affected, effect, cancer, plant, compensation, storage	20	Health	mental, drug, hiv, medical, disease, maternal, tuberculosis, facility, patient, hospital	40	Race—ethnic	racial, ethnic, next, observation, concluding, document, hate, welcome, minority, durban
1	Nuclear Disaster	student, secondary, educational, primary, language, teaching, quality	Education	school, cultural, teacher,	41	Disability	disability, accessible, accessibility, language, intellectual, psychosocial, accommodation, monitoring, data, inclusive girl, gender, sexual, sustainable, disability, goal, change, climate, rural, school	
2	Use of military force	military, force, crime, civilian, jurisdiction, submitted, personnel, welcome, offence, armed	22	Environment pollution	waste, environmental, environment, hazardous, management, chemical, pollution, substance, toxic, product	42	Girl	
3	Terrorism	terrorism, older, political, terrorist, foreign, one, would, counter, individual, security	23	Enforced disappearance	disappearance, missing, enforced, disappeared, crime, war, declaration, relative, search, witness	43	Torture and detention	torture, detention, death, investigation, ill, penalty, allegation, perpetrator, punishment, crime
4	Slavery	slavery, labour, forced, slave, caste, contemporary, worst, servitude, like, marriage	24	Armed conflict	force, civilian, armed, military, security, soldier, scheduled, caste, killing, conflict	44	Gender equality—employment	gender, equality, men, equal, welcome, employment, temporary, migrant, participation, previous one, ministry, many, met, informed, population, would, challenge, centre, since
5	Labor—migrants	worker, labour, employment, employer, migrant, foreign, abuse, recruitment, agency, contract	25	Freedom of assembly	freedom, assembly, association, medium, political, expression, peaceful, restriction, journalist, opinion	45	Procedural	
6	Migrant workers—trafficking	migrant, worker, migration, trafficking, irregular, labour, abroad, employment, data, condition	26	Prisoners	prison, prisoner, detainee, cell, police, staff, gendarmerie, liberty, food, custody	46	Sexual abuse	sexual, department, rape, crime, abuse, police, assault, program, prison, perpetrator

(Continued)

Table A. Continued

#	Topic name	Topic Terms	Topic #	Topic name	Topic Terms	Topic #	Topic name	Topic Terms
7	Migrant workers—civil and social rights	migrant, worker, cultural, foreign, nationality, equal, disability, citizenship, equality, men migrant, asylum, detention, refugee, seeker, centre, immigration, migration, irregular, unaccompanied	27	Death penalty	death, penalty, affair, foreign, moratorium, freedom, ministry, promote, director, worker	47	Minority	minority, combat, gender, trafficking, equality, hate, crime, strategy, migrant, council disappearance, enforced, disappeared, investigation, liberty, obligation, reparation, relative, offence, definition
8	Refugees and asylum seekers	Business company, business, security, private, impact, regulation, enterprise, labour, operation, industry	48	Enforced disappearances II	disappeared, investigation, liberty, obligation, reparation, relative, offence, definition			
9	Land and housing	land, eviction, cultural, project, housing, population, natural, urban, local, forest offence, observation, covered, concluding, welcome, extradition, jurisdiction, regret, submitted, initial judge, judicial, judiciary, prosecutor, lawyer, independence, supreme, council, constitution, power	29	Sex and gender	sexual, gender, abortion, guarantee, combat, labour, lesbian, bisexual, transgender, gay territory, overseas, traveller, dependency, bill, school, assessment, crown	49	Girl—trafficking	girl, gender, next, trafficking, men, equality, rural, marriage, sexual, concluding police, detainee, cell, officer, day, one, station, two, aged, beaten
10	Criminal procedure and due process	Jurisdiction	30	Torture	torture, detention, trafficking, ill, asylum, investigation, police, complaint, enforcement, medical freedom, expression, defender, journalist, association, assembly, political, torture, medium, guarantee	50	Police and detention	armed, recruitment, conflict—child soldiers
11	Judiciary	31	Freedom of expression	torture, detention, trafficking, ill, asylum, investigation, police, complaint, enforcement, medical freedom, expression, defender, journalist, association, assembly, political, torture, medium, guarantee	51	Indigenous rights	armed, conflict, age, force, hostility, military, observation, concluding, school people, consultation, territory, tribal, prior, land, project, natural, declaration, traditional	
12	Freedom of Religion	religious, religion, belief, freedom, muslim, church, minority, christian, catholic, registration	32	Personal security	security, violation, commission, political, conflict, council, end, force, mutilation, condition, rate	53	Internally displaced persons	displaced, internally, conflict, displacement, idp, humanitarian, camp, return, armed, internal
13	Poverty—housing and income	housing, poverty, income, living, aboriginal, benefit, low, employment, condition, rate						

(Continued)

Table A. Continued

#	Topic name	Topic Terms	Topic #	Topic name	Topic Terms	Topic #	Topic name	Topic Terms
14	Poverty—water and food	water, cultural, food, sanitation, poverty, rural, living, population, security, sector	34	Judiciary independence	reform, judicial, judiciary, corruption, commission, strategy, independence, judge, administration, investigation	54	Legislative	bill, treaty, customary, parliament, tribunal, settlement, claim, pacific, partnership, constitutional
15	Race	racial, racism, ethnic, equality, race, black, xenophobia, immigration, profiling, crime	35	Sex trafficking	trafficking, exploitation, sexual, prostitution, tourism, pornography, sale, sex, labour, prosecution	55	General recommendations	poverty, council, freedom, expressed, improve, commitment, promotion, progress, torture, constitution
16	Null	food, gender, hate, people, equality, sexual, worker, disability, minority, ministry	36	Detention	detention, torture, prison, police, detainee, ill, facility, medical, prisoner, liberty	56	Death penalty	death, penalty, sexual, punishment, would, police, challenge, stated, ratify, change
17	Police killing	police, killing, defender, investigation, security, force, death, witness, impunity, extrajudicial	37	Pornography	inter, pornography, prostitution, sexual, alia, sale, account, abuse, data, age	57	Financial	debt, bank, financial, foreign, impact, project, investment, world, fund, obligation
18	Race—African descent	descent, afro, population, racial, poverty, racism, participation, office, informed, structural	38	Review of human rights	gender, disability, ratify, combat, trafficking, torture, promote, improve, ratification, death	58	Minority—cultural rights	minority, ethnic, language, belonging, political, cultural, occupied, population, region, religious
19	Indigenous—regulation	province, provincial, commission, agency, tribal, regulation, administered, jurisdiction, enforcement, commitment	39	Juvenile	disability, school, abuse, age, adolescent, sexual, juvenile, welcome, alternative, punishment	59	Liberty prevention	preventive, liberty, mandate, torture, prevention, office, deprivation, ombudsman, detention, ministry

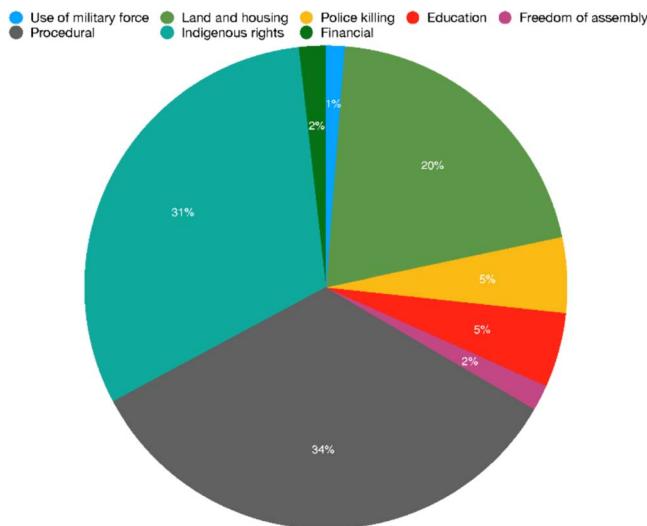


Figure 2. Topical composition of document A/HRC/12/34/ADD.2

is an addendum to a report of the SR on the Situation of Human Rights and Fundamental Freedoms of Indigenous Peoples, dealing with the situation of indigenous rights in Brazil (Figure 2).

What the model tells us is that this document is comprised of 31 per cent of topic 52 (Indigenous rights), 34 per cent of topic 45 (Procedural) and 20 per cent of topic 9 (Land and housing). Taken together, we discern that this document, which given its originating mechanism, deals with indigenous rights, and contains—like many other UN documents—a fair share of procedural terms, with a focus on land and housing. With this method, we can identify all the documents that deal with the topic of land and housing (or any other topic), regardless of the mechanism that produced them or the year in which they were published.

B. Synchronic and Diachronic Patterns in the UN Human Rights Discourse

After mapping the overall composition of the UHRI corpus, the aim of the second stage of analysis is to focus on discursive patterns across the UN human rights system and over the timeframe covered in the database.

(i) Synchronic patterns

One aspect captured by the density model is the *synchronous* pattern of divergence in interests and concerns (identified as topics) of the many mechanisms constituting the UN human rights system. Looking at these patterns, we can discern which topics are most closely associated with each mechanism. For example, the top ten topics in documents stemming from the Committee on the Elimination of Discrimination against Women (CEDAW), a treaty body, are: 49 (Girl-trafficking), 44 (Gender equality—employment), and 42 (Girl), all resonating with part of the protected group under CEDAW's mandate.⁶⁶ Similarly, the prominent topics in documents authored by the Special Rapporteur on Torture and Other Cruel, Inhuman or Degrading Treatment or Punishment are topics 36 (Detention), 50 (Police and detention), and 43 (Torture

⁶⁶ Other examples show similar patterns: CAT's most common topic is 31 (Torture); the CRPD's is 41 (Disability) and SRS-OP-AC's most prevalent topic is 51 (Armed conflict—child soldiers). A detailed table of top-10 topics per mechanism is available in Appendix 2.

and detention).⁶⁷ The situation is somewhat different with the texts grouped under the UPR; the most prevalent topic in UPR documents is topic 55, consisting of relatively disparate terms such as *poverty, council, freedom, improve* and *progress*. The mix between substantive terms such as *poverty or freedom* and more technical action words such as *improve, commitment, promotion*, and *progress*, is atypical. Due to its general and non-thematic nature, as part of the naming process, topic 55 was titled ‘Review of human rights.’ The vague nature of this ‘basket’ topic becomes clearer, when examined in the context of the UPR documents with which it is statistically most associated. Unlike texts produced by TBs or SPs, which often center around a well-defined, coherent issue, UPR texts tend to be much broader and diffuse in their thematic scope.⁶⁸

The synchronic patterns identified using the density shed light on the issues taken up by each mechanism, thus adding a layer of understanding of the diverse interests of the UN human rights system. On the most basic level, the results of this analysis validate our methodology, as we see that the topics, and their naming, thematically correspond to the mechanisms they are most associated with.⁶⁹ The different mechanisms primarily deal with the topics falling under their mandate. Interestingly, in each of the examples brought above (CEDAW, Special Rapporteur on Torture, and UPR), migrant-related topics appear among the top ten topics, even though these mechanisms are not directly entrusted with migrants and refugees. When examined across the entire corpus, we find that of the 55 mechanisms comprising the UHRI corpus, topic 7 (Migrant workers—civil and social rights) appears in the top ten topics of 10 mechanisms and topic 8 (Refugees and Asylum Seekers) in 18 mechanisms. This indicates a phenomenon of mandate expansion and overlap between different UN human rights mechanisms.⁷⁰

(ii) Diachronic patterns

Another aspect captured by the density model is the changing interests and concerns of the human rights system over time. Diachronic patterns refer to the changes in the appearance of topics in the UN human rights system across the years covered in the data.⁷¹ Topic 32 (Freedom of expression), for example, saw a sweeping rise between 2007 and 2020, from being mentioned in only 4 per cent of the documents in the corpus in 2007 to appearing in 25.8 per cent of them in 2020. Topic 37 (Pornography) on the other hand, seems to have fallen out of favor in the UN human rights system: following a growth in prevalence between 2007 and 2010, reaching 2010 peak of appearing in 35 per cent of the documents in the corpus, it plummeted dramatically in the decade since, to only 3.5 per cent in 2020.⁷² The diachronic analysis displays conflicting trends: while some topics gain more traction, the interest in others decline.

Complementing the diachronic analysis is Table B which provides an overview of the ten most prominent topics in the human rights corpus each year, for the years 2007–2020.

Table B shows a preponderance of the procedural topic. Setting that aside, we begin to see

⁶⁷ Other examples show similar patterns: the most common topic of the SR on Freedom of Religion or Belief is topic 12 (Religion); the most common topic of the SR on Minority Issues is topic 58 (Minority—cultural rights). The most common topic of the WG on Transnational Corporations is topic 28 (Business) and that of the IE on sexual orientation is topic 29 (Sex and gender).

⁶⁸ Supporting this analysis is the composition of the topics, which shows that topic 55 is broader not only in its semantic scope but also in its distribution over the words. Topic 55’s most prominent word is only 0.7 per cent. This is very low in comparison to the most prominent word in more coherent topics which average on 5.8 per cent.

⁶⁹ As was detailed in the previous section, the process of naming was conducted based on the algorithmic output of word lists. Only after the naming process was concluded did we move to the second stage of the density, which included tracing the ‘originating’ mechanism of each topic.

⁷⁰ There are of course treaty bodies and special procedures whose mandate directly relates to migration issues, such as the Committee on the Protection of the Rights of All Migrant Workers and Members of their Families (CMW), the Special Rapporteur on the human rights of Migrants and the Special Rapporteur on Trafficking in Persons, especially Women and Children

⁷¹ A topic’s appearance was counted only if it composed more than 1 per cent of the document. For a mechanism to be counted as discussing a topic, the threshold was 10 per cent of the mechanism’s documents of that year.

⁷² For a comprehensive table of annual changes in topic appearances, see Appendix 3.

Table B. Top-10 topics per year, with topics ordered according to their relative prevalence in the documents from that year

Year	1	2	3	4	5	6	7	8	9	10
2007	Procedural	Girl—trafficking	Terrorism	Gender equality—employment	Pornography	Torture and detention	Use of military force	Refugees and asylum seekers	Criminal procedure and due process	
2008	Procedural	Girl—trafficking	General recommendations	Criminal procedure and due process	Pornography	Terrorism	Poverty—water and food	Race—ethnic	Torture and detention	
2009	Procedural	Girl—trafficking	General recommendations	Torture and detention	Pornography	Detention	Torture	Judiciary	Education	Terrorism
2010	Procedural	Pornography	General recommendations	Torture and detention	Girl—trafficking	Poverty—water and food	Education	Detention	Terrorism	Refugees and asylum seekers
2011	Procedural	General recommendations	Girl—trafficking	Education	Death penalty II	Migrant workers—civil and social rights	Detention	Poverty—water and food	Refugees and asylum seekers	Torture and detention
2012	Procedural	Girl—trafficking	Poverty—water and food	Pornography	Torture and detention	Migrant workers—civil and social rights	General recommendations	Refugees and asylum seekers	Education	Minority—cultural rights
2013	Procedural	Girl—trafficking	Torture and detention	Poverty—water and food	Judiciary	Torture	Sex and gender	Juvenile	Sex trafficking	Criminal procedure and due process
2014	Girl—trafficking	Sex and gender	Torture and detention	Procedural	General recommendations	Torture	Poverty—water and food	Education	Refugees and asylum seekers	Review of human rights
2015	Procedural	Sex and gender	Refugees and asylum seekers	Girl	Girl—trafficking	Sex trafficking	Torture and detention	Poverty—water and food	Freedom of assembly	Juvenile
2016	Sex and gender	Girl	Procedural	Poverty—water and food	Girl—trafficking	Refugees and asylum seekers	Sex trafficking	Juvenile	Disability	Gender equality—employment
2017	Sex and gender	Girl	Torture and detention	Refugees and asylum seekers	Disability	Gender equality—employment	Girl—trafficking	Torture	Detention	Sex trafficking
2018	Sex and gender	Girl	Torture and detention	Poverty—water and food	Sex trafficking	Gender equality—employment	Disability	Girl—trafficking	Refugees and asylum seekers	Review of human rights
2019	Girl	Sex and gender	Refugees and asylum seekers	Disability	Gender equality—employment	Sex trafficking	Gender equality—employment	Poverty—water and food	Torture and detention	Review of human rights
2020	Girl	Sex and gender	Procedural	Disability	Gender equality—employment	Review of human rights	Poverty—water and food	Minority	Business	Sex trafficking

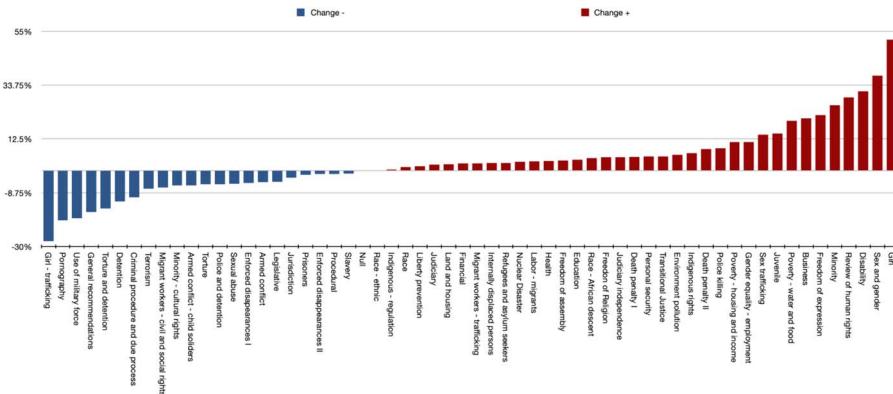


Figure 3. Overall change (increase or decrease) in the number of documents in which a topic appeared between 2007 and 2020, as a percentage from the total number of documents each year.

trends in the *substantive* topical composition. Sex and gender issues consistently occupy the top three most discussed topics each year: topics 29 (Sex and gender), 35 (Sex trafficking), 37 (Pornography), 42 (Girl), 44 (Gender equality), 46 (Sexual abuse), 49 (Girl-trafficking). In fact, in thirteen of the fourteen years covered in the corpus, a sex and gender-related topic is always the first substantial topic discussed in the UN corpus. Moreover, between 2007 and 2014, at least two of the ten most prevalent topics each year come from this cluster. Starting in 2015, we see a doubling of this ratio, and even up to half of the most prominent topics discussed each year belonging to sex and gender. This is true also for mechanisms that were not directly entrusted with such issues. Continuing the trend regarding the prevalence of migrant-related topics in the synchronic analysis, this, too, might indicate a phenomenon of expansion of mandate and overlap between mandates of different UN human rights mechanisms.

C. Measuring the Density of Discourse of the UN Human Rights System

Applying the equations of the model, Figs 3 to 6 demonstrate two key components in measuring the density of discourse in the UHRI corpus: the change-over-time in the number of *documents* discussing a certain topic, and the change-over-time in the number of *mechanisms* discussing a certain topic.⁷³ We examine the findings along these two axes:

(i) Documents Axis

In order to assess the density of the system, we measured the prevalence of each topic's appearance as a percentage of the total number of documents each year. Figure 3 shows the overall change (increase or decrease) in the number of documents in which a topic appeared between 2007 and 2020, as a percentage from the total number of documents each year.⁷⁴

What is gleaned from Figure 3 is that 37 out of 60 topics *increased* their relative appearance between 2007 and 2020, while 22 topics decreased. For example, topic 2 (Use of military force) appeared in 2007 in almost 25 per cent of the documents in the UN human rights system that year, while in 2020 it was present in only 3.5 per cent of the documents, marking an overall

⁷³ Each document was counted only if it had at least composed of 1 per cent of the topic. While for a mechanism to be counted as discussing a topic, the first threshold needed to be reached in at least 10 per cent of the mechanism's documents of that year.

⁷⁴ By looking at percentile data instead of nominal data, effects of changes in the total number of documents each year are mitigated.

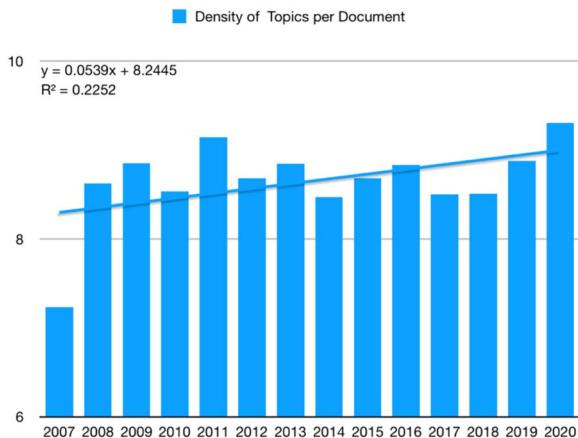


Figure 4. Density of Topics Per Document by Year.

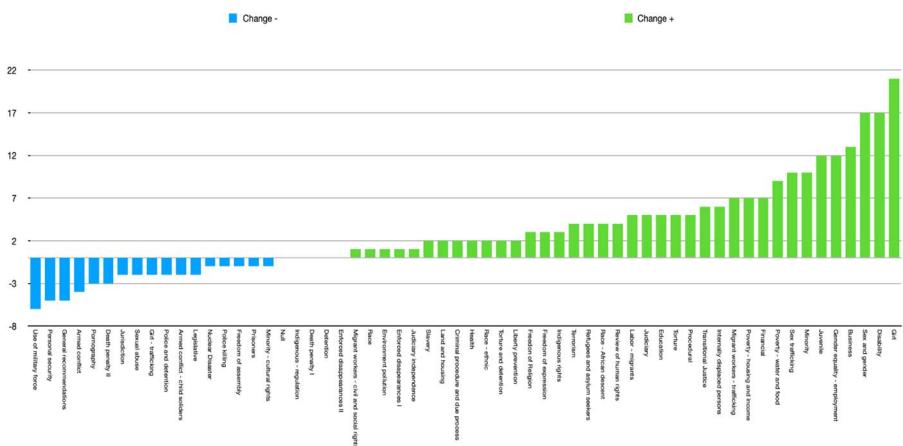


Figure 5. Overall change (increase or decrease) in the number of mechanisms dealing with a certain topic.

decrease of 18 per cent. Topic 14 (Poverty—water and food), on the other hand, increased by almost 20 per cent, rising from 15 documents in 2007 to 27 documents in 2020.

Moreover, applying Equation I to calculate density over the years, we created Figure 4 showing changes in density of topics for documents over time.

Two main insights gathered from Figures 3 and 4 shed light on density of discourse. First, the aggregated information confirms that overall, more topics are discussed each year in UN human rights documents. Thus, the UN human rights system is expanding its coverage, with seemingly more issues and concerns being taken up each year, signifying that the system becomes denser over time in the documents axis; Second, a UN human rights document, on average, deals with more topics every year. This, too, indicates a trend of density of discourse, because the thematic focus of each document expands to discuss more human rights issues. This gradual expansion of the topical coverage of each document might indicate a possible change in the perception of the document authors' as to what falls under their mandate—what they can and must address.

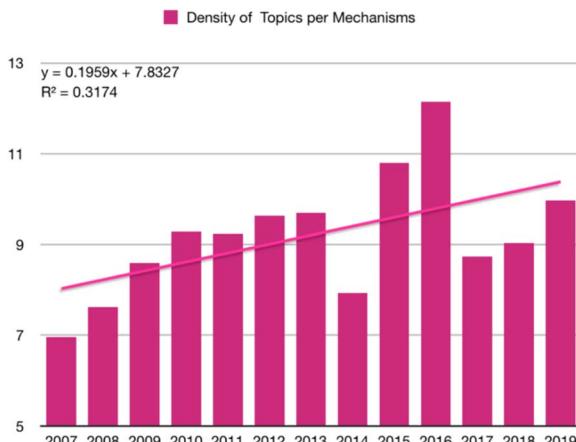


Figure 6. Density of Topics per Mechanisms.

(ii) Mechanisms Axis

Another dimension when measuring the density of the system can be gathered from the number of mechanisms dealing with a topic. The density model reveals that 38 of the 60 UHRI corpus topics appeared in more mechanisms in 2019 than in 2007, while seventeen topics appeared in less mechanisms over the same time.⁷⁵ This indicates that, overall, the different mechanisms of the UN human rights system discussed more topics each year. On average, topics appeared in three more mechanisms in 2019 than they did in 2007. Figure 5 provides an overview of the overall change (increase or decrease) in the number of mechanisms dealing with a certain topic.

For example, between 2007 and 2019, topic 14 (Poverty—water and food) was not only discussed in more documents, but in more mechanisms: nine additional mechanisms picked up the issue of Poverty—water and food, over the years. Topic 47 (Minority) discussed by only two mechanisms in 2007—Special Rapporteur on Racism and Committee against Torture—was discussed by 14 different mechanisms in 2019.

In addition, we applied Equation II to calculate the density in the mechanisms over the years to build (Figure 6), indicating changes in density of topics in mechanisms over time.

As with the documents' level, here too we see an expansion of the thematic boundaries between the different mechanisms, expanding their thematic coverage—and perhaps also their mandate—to discuss more issues and matters than they used to. The appearance of a certain topic in a greater number of documents indicates how commonly this topic is referred to. A higher count of mechanisms discussing a topic may attest that at times a specific topic expands beyond the narrow constraints of a specific mandate. Moreover, it appears that more topics are being presented in each mechanism; thus, the mechanisms axis is more densely populated over the years, with a peak in 2016. It should be noted, however, that a topic can also decline in its relative document frequency, but still appear in the same number of mechanisms, or even in more mechanisms. Only when a topic has gone down on both metrics, can we conclusively infer that it has become less prominent in the human rights discourse; and a topic that has risen in both metrics can be seen as one that gained prominence.

Zooming in on Figs 3–6 we can discern which topics are more salient over time, and how the density of the overall system is evolving. Furthermore, by combining both axes we can

⁷⁵ Calculated as the sum of mechanisms in which a topic appeared (more than 10 per cent per year). We omitted 2020 because the UHRI data lacked some of the mechanisms' documents for this year.

Table C. Changes in norm density between 2007 and 2019, combined by both mechanisms and by documents

	Increase of Density in Mechanisms	Unchanged Density in Mechanisms	Decrease of Density in Mechanisms
Increase of Density in Documents	30	1	3
Unchanged Density in Documents	0	1	0
Decrease of Density in Documents	8	3	14

determine the changes in density between 2007 and 2019; this can be seen in [Table C](#), which juxtaposes changes in density both by mechanism and by document. By examining these results, we can conclude that the UN human rights system is becoming denser overall, based on the analysis of both the documents axis and the mechanisms axis in the system, regarding the topic appearance patterns in each. 30 topics became denser in both mechanisms and documents, while only 14 decreased during the same period. However, 16 topics had more complicated patterns of change in density. For instance, eight topics increased their mechanisms density but decreased in documents density. Thus, these topics appear today in more mechanisms, but are less dominant across the documents that mention them. Importantly, [Table C](#) demonstrates a strong correlation of changes in density between mechanisms and documents: where more topics are addressed more (or less) by more mechanisms, they also tend to appear in more (or less) documents.

First, regarding the substantive critique addressing the puzzle of human rights proliferation—overall we see that the system is becoming denser in its composition. This may support the claim of human rights proliferation, especially when understood as discourse density. Moreover, there are also indications for proliferation in its traditional, linear, sense with the rise in prevalence of some topics often considered to be ‘new’ rights, such as those relating to disability rights and business and human rights. However, we also see that this rise is met with a decline in other topics such as those which relate to core issues of security and terrorism. We do not claim that those ‘new’ topics are less important than the ‘old’ topics, but we do argue that the rise of the ‘new’ topics may support the claims of proliferation. In terms of proliferation as discourse density, these parallel shifts do not cancel each other out. Our model shows that overall, the trend is for more topics to be discussed within the UN human rights system in two complementing senses. UN documents, on average, deal with more human rights topics with every passing year; and more human rights mechanisms discuss and make more recommendations with respect to more topics. This indicates that on the substantive level the system becomes denser in its, and this might lead to certain structural problems, as would be discussed in the next paragraph.

The second puzzle that the density model might help us understand better is the structural problem of the UN human rights system. As mentioned above, this might indicate a trend of overlaps and gaps between different mechanisms and bodies. This can bring us to a situation where, on the one side, certain topics are over discussed by bodies, while other topics do not gain the attention needed by the relevant bodies. As we saw, certain topics tend to become highly popular in the discourse—such as disability, minority, freedom of expression and business. This means that many of the system’s (already very limited) resources are directed at promoting those topics. However, not less important topics such as pornography, girl-trafficking, use of military

force, and torture and detention are in decline. This can be interpreted in two ways. First, that the topics that are in decline are dealt now only by the relevant mechanisms that ‘originally’ possess the mandate to deal with them. However, it can also indicate that certain topics might be overall neglected by the system in favor of more fashionable topics that all the mechanisms want to have a ‘say’ on them (even if the latter topics are equally important). Such a situation is highly problematic, since it might suggest that certain mechanism overreach on the expense of fulfilling their original mandates. Thus, harming the systematic effort of the UN system to promote human rights. This also indicates that there might be a problem in the allocation of the system’s scarce resources that should be examined on an institutional level.

(iii) Micro case studies

While we believe that the cumulative impact of the monitoring bodies’ work is the most important factor, we will briefly demonstrate our arguments about proliferation and structural issues by closely examining two specific documents which, based on our analysis, consist of a relatively large number of topics. These two documents were authored by the Human Rights Committee (which is responsible for the implementation of the ICCPR), and the Committee on Economic, Social and Cultural Rights (which is responsible for the implementation of the ICESCR).

The first document is a periodic concluding observation by the Human Rights Committee on Japan’s implementation of the ICCPR.⁷⁶ Based on our analysis, this document contains 17 topics and covers a wide range of subject-matters. While some of the themes could be considered ‘classic’ civil and political rights,⁷⁷ others raise questions about the proliferation and efficiency of the system. For instance, six out of the 34 sections deal with women’s rights,⁷⁸ covering areas such as women’s representation in public office and the private sector, the definition of rape in national law, and domestic violence. While the ICCPR does protect gender equality (Article 3), the UN has specialized bodies like CEDAW, a SP working group, and a Special Rapporteur that focus on women’s rights, discrimination and violence against women and girls. The report also touches on issues like the application of labor laws to non-citizens,⁷⁹ and children’s rights.⁸⁰ While one might argue that the ICCPR contains provisions against discriminations (Article 26), and children’s rights (Article 24), given the very limited resources of the UN system, these topics might be more relevant for the specialized bodies such as the Committee on the Rights of the Child and the CESCR.

The second micro case study is a CESCR periodic concluding observation on Tunisia’s implementation of the ICESCR.⁸¹ Based on our analysis, this document contains 16 topics. Here too we see that this document covers not only core economic, social, and cultural rights like housing, work, and social security,⁸² but also ventures into areas that are arguably outside the Convention’s primary scope. For instance, the report discusses gender related topics such as violence against women,⁸³ gender equality⁸⁴ and discrimination based on sexual orientation.⁸⁵ While the ICESCR does prohibit discrimination regarding application of rights granted by the

⁷⁶ Human Rights Committee, Concluding observations of the Human Rights Committee—Japan, 18 December 2008, CCPR/C/JPN/CO/5.

⁷⁷ Ibid. at paras 10, 16, 17, 18, 19, 21.

⁷⁸ Ibid. at paras 11, 12, 13, 14, 15, 22.

⁷⁹ Ibid. at para 24

⁸⁰ Ibid. at paras 27–28.

⁸¹ Committee on Economic, Social and Cultural Rights, Concluding observations on the third periodic report of Tunisia, 14 November 2016, E/C.12/TUN/CO/3.

⁸² Ibid. at paras 28–31, 34–37.

⁸³ Ibid. at paras 38–39.

⁸⁴ Ibid. at paras 26–27.

⁸⁵ Ibid. at paras 24–25.

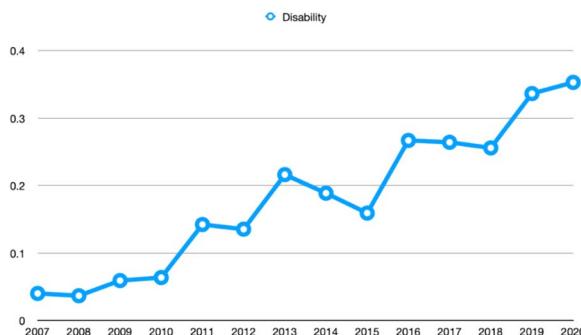


Figure 7. Prevalence of Topic 41 (disability) across the UN human rights System.

Convention (Articles 2(1) and 3), these topics may be more appropriately handled by specialized bodies. The document also examines general anti-discrimination legislation⁸⁶ which is usually seen as falling under Article 26 of the ‘sister convention’—the ICCPR (as is also acknowledged by the ICESCR Committee, which ‘nonetheless notes with interest the proposals for the adoption of a general anti-discrimination law’⁸⁷). These examples illustrate how the different treaty bodies tend to discuss subjects that are not strictly within their core mandates, potentially overlapping with the work of other specialized mechanisms. This raises questions about the proliferation and efficiency of the UN human rights system.

6. DYNAMICS OF CHANGE IN THE DENSITY OF THE UN HUMAN RIGHTS DISCOURSE

As demonstrated above, there is evidence that the UN human rights system becomes denser over time. Alongside the overall increased density of the system, as shown above, we also observe certain topics becoming less popular in the discourse over time. We focus now on three examples of shifts in patterns of density arising from the data using the density model on both axes (documents and mechanisms). We would like to point out that the interpretation of the results is merely suggestive, and we do not try to claim causation. This is, among others, because the topic modeling method as it is does not provide us with the tools to do so.

A. The Increased Density of Disability and Business Topics

(i) Disability

One of the most striking examples of increased density, namely of a topic that has been discussed more in recent years, both by number of documents, and by number of mechanisms, is topic 41 (Disability). In 2007, disability was discussed in a mere five documents. Over the years, the topic permeated the UN human rights system, so that by 2020, 30 per cent of the documents in the UHRI corpus discussed the topic of disability. More mechanisms also began discussing the topic: in 2007 disability appeared in four mechanisms, while in 2019 it was discussed by 17 more mechanisms, a total of 21 mechanisms that dealt with the issue of disability. Figure 7 zooms in on this topic to show the change in its overall prevalence across the corpus between 2007 and 2020.

The rise of the disability in the specific mechanisms included in the UHRI topic might be explained by the fact that in recent years issues of disability and human rights have been

⁸⁶ Ibid. at paras 20–21.

⁸⁷ Ibid. at para 21.

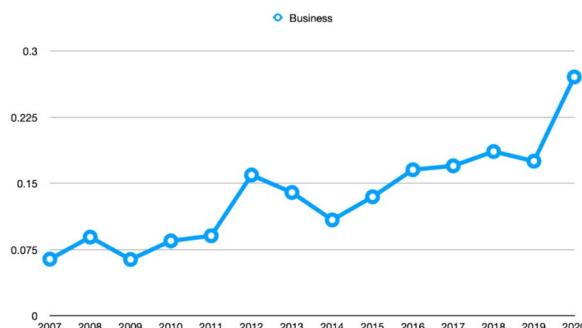


Figure 8. Prevalence of Topic 48 (business) across the UN human rights System.

widely discussed in the wider UN fora.⁸⁸ Although rights of people with disabilities were already recognized in the 1975 General Assembly Declaration on the Rights of Disabled Persons,⁸⁹ it was only in 2006 that the Convention on the Rights of Persons with Disabilities (CRPD) and its Optional Protocol were adopted.⁹⁰ The CRPD and the Optional Protocol were opened for signature in 2007, and entered into force in 2008.⁹¹ The CRPD Committee was also formally established in 2008. As of today, 185 countries have ratified the CRPD, making it one of the most ratified UN human rights treaties.⁹² A possible explanation for this widespread ratification is that the topic of disability is in general considered a ‘safe’ or uncontroversial one, granting states an opportunity to demonstrate their progressiveness.⁹³ Moreover, in 2014 the HRC appointed a SR on the Rights of Persons with Disabilities.

Furthermore, as in other major human rights treaties, the CRPD itself introduces an expert review process requiring member states to report to the CRPD Committee about the situation of implementation of the treaty in those countries. The Committee then reviews the country report along with parallel reports from civil society, and then gives recommendations to the member state—called concluding observations, which are part of the UHRI database.⁹⁴

(ii) Business and human rights

The second example of a rise in density of discourse is the topic of business and human rights. Topic 28 (business) consists of terms related to the private sector and industry. The number of documents discussing topic 28 has grown by 21 per cent from 2007 to 2020, appearing in more than a quarter (27 per cent) of the documents in 2020 and in 13 more mechanisms than in 2007. Figure 8 focuses on topic 28 to show the change in its prevalence across the corpus between 2007 and 2020.

⁸⁸ Sabatello and Schulze (eds), *A Short History of the International Disability Rights Movement*, in Human Rights and Disability Advocacy (2013) at 13.

⁸⁹ Declaration on the Rights of Disabled Persons 1975, GA Res 3447 (XXX) (1975).

⁹⁰ Convention on the Rights of Persons with Disabilities 2006, GA Res 61/106 (2006).

⁹¹ 10th anniversary of the adoption of Convention on the Rights of Persons with Disabilities (CRPD), UN Department on Economic and Social Affairs (2016), available at: [www.UN.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities-crpds-crpds-10.html](http://www.UN.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/the-10th-anniversary-of-the-adoption-of-convention-on-the-rights-of-persons-with-disabilities-crpds-crpds-10.html) [last accessed 20 June 2024].

⁹² Convention on the Rights of Persons with Disabilities (CRPD), UN Department on Economic and Social Affairs, available at: www.UN.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities.html [last accessed 3 February 2023].

⁹³ Kanter, ‘Do human rights treaties matter: The case for the UN convention on the rights of people with disabilities’ (2019) 52(3) *Vanderbilt Journal of Transnational Law* 577 at 592.

⁹⁴ CRPD, *supra* note 32 at articles 34–36.

The topic of business and human rights also rose dramatically in the UN discourse. Historically, commercial corporations have been gaining immense power over the years.⁹⁵ Moreover, many states (especially economically developing states which relied financially on the international corporations) were unwilling or unable to enforce international human rights standards on those corporations. All of this created a gap in the protection that international human rights norms could offer. Given that some of the most serious human rights violations in recent decades have been conducted by international corporations (and not directly by states), the need to clarify obligations of states and corporations on this subject has risen to the fore. Therefore, following a resolution of the UN HRC in 2005, the UN Secretary General appointed a Special Representative on the subject of human rights and transnational corporations and other business enterprises.⁹⁶ In 2011 the Special Representative presented the 'Guiding Principles on Business and Human Rights: Implementing the United Nation's "Protect, Respect and Remedy" Framework,' (UNGPs)⁹⁷ which was endorsed by the HRC.⁹⁸ The UNGPs were adopted after a wide international consultation process which included research reports and pilot projects.⁹⁹ In the same year the HRC also established a special working group on this issue.¹⁰⁰

To summarize, both topics address very important issues, previously somewhat neglected. While the topic of disability highlights the special rights and needs of disabled people, the topic of business deals with the highly tenuous issue of human rights violations by private actors. In both cases, our analysis shows not just that these topics have been added to the ecosystem of human rights in the linear sense, but that they have contributed to the increased density of the system, i.e. they are topics addressed by more documents and more mechanisms over time.

B. The Decline of the Security and Terror Cluster

Alongside topics contributing to density of discourse, are others whose prevalence has dropped. A trend in the data which is consistent, and perhaps counterintuitive, is the decline in a cluster of topics relating to security and terror. These are five topics: topic 2 (Use of military force), topic 3 (Terrorism), topic 24 (Armed conflict), topic 43 (torture and detention), and topic 51 (Armed conflict—child soldiers). The discussions of all these topics, especially torture and detention, have on average declined over the years in both documents and mechanisms. Figure 9 zooms in to show the aggregated decline in the prevalence of the security and terror-related cluster in the corpus between the years 2007 and 2020.

State sanctioned torture as well as military and other operations against terror still exist, of course, as do violations, and the UN human rights system continues to address these.¹⁰¹ Yet it

⁹⁵ Butler, 'The Corporate Keepers of International Law' (2020) 114 *American Journal of International Law* 189.

⁹⁶ CHR Res 2005/69, Human Rights and Transnational Corporations and other Business Enterprises, 20 April 2005, E/CN.4/RES/2005/69.

⁹⁷ Report of the Special Representative of the Secretary-General on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises, John Ruggie: Guiding Principles on Business and Human Rights: Implementing the United Nations 'Protect, Respect and Remedy' Framework 2011, (2011) A/HRC/17/31, 21 March 2011, available at: <https://www.ohchr.org/en/special-procedures/wg-business/special-representative-secretary-general-human-rights-and-transnational-corporations-and-other> [last accessed 20 June 2024].

⁹⁸ Addo, 'The Reality of the UN Guiding Principles on Business and Human Rights' (2014) 14(1) *Human Rights Law Review* 133.

⁹⁹ Sherman III, 'Beyond CSR: The Story of the UN Guiding Principles on Business and Human Rights' in Lindsay and Martella (eds), *Corporate Responsibility, Sustainable Business: Environmental, Social and Governance Frameworks for the 21st Century* (2022) 4; Backer, 'Moving Forward the UN Guiding Principles for Business and Human Rights: Between Enterprise Social Norm, State Domestic Legal Orders, and the Treaty Law that Might Bind Them All' (2015) 38(2) *Fordham International Law Journal* 457.

¹⁰⁰ HRC Res 17/4, Human rights and transnational corporations and other business enterprises, 6 July 2011, A/HRC/RES/17/4.

¹⁰¹ A possible explanation for this drop is the decline in the predominance of the 'war on terror' rhetoric that rose to the fore after the September 11 attacks in 2001. A major criticism of NATO states by different UN mechanisms was the violation of basic human rights—such as torture, illegal detention and targeted killings performed at that time; see Roberts, 'Torture and Incompetence in the "War on Terror"' (2007) 49(1) *Survival* 199; Sanders, 'Human Rights Abuses at the Limits of the



Figure 9. Prevalence of security and terror topics across the UN human rights System.

seems that in terms of density this cluster of terror and security related norms have lost their prominence, perhaps ‘crowded out’ by other rising topics.

Therefore, while we can identify patterns of expansion and growth of new areas in the UN human rights eco systems, we also recognize areas that have ‘shrunk,’ or ‘de-proliferated’ in relative terms. To be sure, this is not to say that they are not of continuing concern, but that their relative weight in the UN human rights system is lower.

C. The ‘Conservation of Energy’ in the Sex-and-Gender Related Topics

A third possible pattern of changes in density that our analysis presents is issue-areas in which attention has shifted (or migrated) between related topics. This is evident in the cluster of topics related to sex and gender. Looking at Figure 3 above—changes in topics by documents—the topic that showed the greatest increase in its document appearance is topic 42 (Girl). The number of documents discussing the topic has grown tremendously, from less than 1 per cent of the documents discussing it in 2007 to more than half of the UN human rights documents discussing aspects of the topic in 2020. Figure 5 above shows that topic 42 also appeared in 21 more mechanisms, rising from three mechanisms in 2007 to 24 in 2019. In close succession, by documents, is topic 29 (Sex and Gender), with the number of documents discussing it rising by 37 per cent. Topic 29 also gained prominence among the different mechanisms, being discussed by 17 more mechanisms between 2007 and 2019. However, Figure 3 also shows that the two topics which experienced the sharpest decline in the number of documents mentioning them are also sex and gender-related: topic 49 (Girl-trafficking) followed by topic 37 (Pornography). This decline is similarly exhibited in the mechanisms graph (Figure 5). What the density model reveals is that while two gender-topics gained prominence in the human rights documents, two other such topics saw a parallel drop. This mirror image movement might suggest that at times the sum of ‘energy’ invested in the gender issue has not increased—there is not more relative attention given to gender matters but rather a diversion of the attention from one gender issue to another.

An interesting case study in this regard is the topic of Girl-trafficking that has shown a significant decline in UN human rights system discourse, both in the number of documents and in the number of mechanisms discussing it. Yet in the correlative periods, activity in other fora has been significant. The Protocol to Prevent, Suppress and Punish Trafficking in Persons,

Especially Women and Children, supplementing the UN Convention against Transnational Organized Crime (also known as the Palermo Protocol) came into force in 2003.¹⁰² Currently 179 states are parties to this Protocol, displaying almost universal membership.¹⁰³ Also, in 2004 the UN HRC appointed a SR on trafficking in persons, especially women and children.¹⁰⁴ The SR issues annual reports on this subject—also part of our database.

In 2009 the UN Office on Drugs and Crime issued a landmark report regarding trafficking in persons.¹⁰⁵ The report, based on data collected from 155 countries, showed that the most common form of human trafficking is for sexual exploitation (79 per cent, at the time).¹⁰⁶ Also, women are disproportionately more affected by human trafficking.¹⁰⁷ The report also showed that 63 per cent of the countries have amended their legislation on trafficking in order to conform with the provisions of the Protocol.¹⁰⁸ Moreover, 57 per cent of the reporting countries reported at least one human trafficking prosecution, and 73 countries reported at least one conviction.¹⁰⁹ This information was largely evaluated as a success to the implementation of the Palermo Protocol and protection of individuals (and especially women) against trafficking.

However, despite the adoption of the Palermo Protocol, human trafficking still remains a widespread global problem.¹¹⁰ According to UN data, as of 2020 trafficking involves more than 20 million people worldwide, only a fraction of which are recognized as victims and supported in the process of social inclusion.¹¹¹ In 2020 the SR on the issue published a detailed report regarding the implementation of the Protocol, marking the 20th anniversary of the Palermo Protocol. The SR suggested to solve part of the problems by shifting the focus from a law enforcement approach to an approach that is centered on human rights and victims.¹¹²

In this area (girl-trafficking) there appears to be a significant dissonance between the decreased discursive attention devoted to the topic as detected and understood by our topic-modeling, on the one hand, and the volume of legal and other activity in this area, on the other hand. It is difficult to precisely discern the character of this obverse relationship. The specialized nature of the Palermo Protocol may have displaced discussion of these crucial human rights issues in more general human rights mechanisms and documents; A more pessimistic possible interpretation can be that states may have lost interest and hope in this area.

¹⁰² Protocol to Prevent, Suppress and Punish Trafficking in Persons, Especially Women and Children, supplementing the UN Convention against Transnational Organized Crime 2003, GA Res 55/25 (2000).

¹⁰³ Ibid.

¹⁰⁴ HRC Res 44/4, Trafficking in persons, especially women and children: strengthening human rights through enhanced protection, support and empowerment of victims of trafficking, especially women and children, 16 July 2020, A/HRC/RES/44/4.

¹⁰⁵ UNODC report on human trafficking exposes modern form of slavery, UN Office on Drugs and Crime, February 2009, available at: <https://www.unodc.org/unodc/en/human-trafficking/global-report-on-trafficking-in-persons.html> [last accessed 20 June 2024].

¹⁰⁶ Ibid at 6.

¹⁰⁷ Ibid.

¹⁰⁸ Ibid at 8.

¹⁰⁹ Ibid.

¹¹⁰ Scarpa, 'UN Palermo Trafficking Protocol Eighteen Years on A Critique' in *the Palgrave International Handbook of Human Trafficking* (2020) 623.

¹¹¹ Gianniararo, *20 Years After: Implementing and Going Beyond the Palermo Protocol*, UN Human Rights Office of the High Commissioner, A/75/169, 17 July 2020, available at: <https://www.ohchr.org/en/documents/thematic-reports/a75169-20-years-after-implementing-and-going-beyond-palermo-protocol> [last accessed 20 June 2024].

¹¹² Ibid.

The three types of examples above, demonstrate that the picture that the increasing density of discourse reveals is more complicated when we zoom into the density pattern. While overall the system covers more topics over time, and different UN mechanisms are diversifying (for better or for worse) the number of topics which they discuss, it is not a one way direction. Also, the different patterns validate the concerns about possible systematic problems—that while some mechanisms might ‘trespass’ their subject-matter authority, they ignore other important human rights topics which they should promote.

7. CONCLUSION

In conclusion, our research has made significant contributions to the study of human rights discourse. By employing a computational method and conducting an extensive empirical study using a unique database of 180,000 recommendations from UN institutions, we have shed new light on the evolution of human rights discourse over time and in substance. Through the application of our machine learning-enabled Density of Discourse model, we have provided valuable insights into the challenges and criticisms faced by the UN human rights system and its mechanisms in recent years. Our findings have demonstrated that the proliferation of human rights may be less pronounced than the shifts in attention to specific rights within the discourse. We have identified topics that have gained prominence while others have diminished, revealing important patterns in the discourse. Notably, we have observed increased attention to disability rights and business and human rights, a decline in discourse around war and terror themes, and a conservation of interest within the sex/gender cluster. Furthermore, our Density of Discourse model has proven to be a useful methodological tool for analyzing and understanding discourse in various fields, both legal and non-legal. Its ability to provide a comprehensive picture of topical distribution, trends, and temporal changes, as well as variations among different agents and institutions, makes it highly applicable in diverse contexts such as judicial deliberations, legislation processes, and treaty negotiations.

As we continue to explore and apply innovative computational tools, our research serves as a starting point for deepening our understanding of discourse surrounding universally important subjects like human rights. We encourage further exploration in this area to build upon our findings and enhance our collective knowledge in safeguarding human rights on a global scale.

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APPENDICES

Appendix 1. Cleaning and tokenising process

For preparing our corpus for the topic model, we conducted the following steps:

1. Tokenising: The documents are tokenised into words using RegexpTokenizer from NLTK, using `r'\w+'` as the regular expression
2. Remove Numeric Tokens: Numeric tokens are removed from the documents, retaining only alphanumeric tokens.
3. Remove Stopwords: Common English stopwords are removed from the documents using the NLTK package.
4. Remove Country Names: Country names are removed from the documents to reduce noise, as we do not want our topics to derive from different country names.
5. Remove Single Character Tokens: Tokens consisting of only one character are removed.
6. Word List Removal: The following list of words, including months, common terms, and technical words, is removed from the documents:

‘january’, ‘february’, ‘march’, ‘april’, ‘may’, ‘june’, ‘july’, ‘august’, ‘september’, ‘october’, ‘november’, ‘recommended’, ‘recommendation’, ‘recommends’, ‘recommend’, ‘rapporteur’, ‘special’, ‘commended’, ‘unhcr’, ‘subcommittee’, ‘noted’, ‘rom’, ‘visit’, ‘urge’, ‘britian’, ‘add’, ‘according’, ‘asked’, ‘december’, ‘del’, ‘note’, ‘often’, ‘must’, ‘cmw’, ‘reservation’, ‘question’, ‘upon’, ‘welcomed’, ‘call’, ‘covenant’, ‘comment’, ‘la’, ‘un’, ‘derechos’, ‘en’, ‘de’, ‘du’, ‘le’, ‘los’, ‘para’, ‘cent’, ‘crc’, ‘ccpr’, ‘upr’, ‘cerd’, ‘cedaw’, ‘great’, ‘art’, ‘state’, ‘expert’, ‘independent’, ‘committee’, ‘party’, ‘group’, ‘palestinian’, ‘syrian’, ‘convention’, ‘periodic’, ‘concerned’, ‘mechanism’, ‘human’, ‘right’, ‘government’, ‘article’, ‘report’, ‘inspectorate’, ‘call’, ‘invite’, ‘commends’, ‘humanos’, ‘droits’, ‘viet’, ‘libyan’, ‘european’.

7. Lemmatisation: Lemmatisation is applied to all the tokens to normalise the words.

Appendix 2. 10-top topics per mechanism

	1	2	3	4	5	6	7	8	9	10
CRC-OP-AC	Armed conflict—child soldiers	Use of military force	Criminal procedure and due process	Pornography	Torture and detention	Transitional Justice	Armed conflict	Juvenile	Education	Torture
SR Toxic wastes	Environment pollution	Procedural Business	Terrorism	Poverty—water and food	Land and housing	Nuclear Disaster	Financial	Labor—migrants	Poverty—housing and income	
SR Food	Poverty—water and food and income	Procedural	Land and housing	Financial	Indigenous rights	Business	Poverty—housing and income	Environment pollution	Gender equality—employment	
SR Housing	Poverty—housing and income	Procedural	Land and housing	Poverty—water and food	Internally displaced persons	Girl	Girl	Terrorism	Migrant workers—trafficking	
SR Freedom of religion	Freedom of Religion	Terrorism	Procedural	Freedom of assembly	Minority—cultural rights	Armed conflict	Migrant workers—civil and social rights	Detention	Detention	
WG Disappearances	Enforced disappearances I	Transitional Justice	Enforced disappearances II	Procedural	Terrorism	Use of military force	Torture and detention	General recommendations	Judiciary	Police killing
WG Arbitrary detention	Detention	Refugees and asylum seekers	Judiciary	Procedural	Terrorism	Liberty prevention	Police and detention	Torture and detention	Freedom of assembly	Torture
SR Indigenous	Indigenous rights	Procedural	Land and housing	Legislative	Freedom of assembly	Education	Terrorism	Police killing	Minority—cultural rights	Poverty—housing and income
WG Mercenaries	Business	Terrorism	Procedural	Armed conflict—child soldiers	Armed conflict	Police killing	Use of military force	Transitional Justice	Torture and detention	
SR Education	Education	Procedural	Financial	General recommendations	Poverty—water and food	Migrant workers—civil and social rights	Disability	Terrorism	Review of human rights	Girl
SR Independence of judges	Judiciary	Procedural	Judiciary independence	Freedom of assembly	Terrorism	Detention	Use of military force	Sexual abuse	Personal security	Liberty prevention
SR Violence against women	Procedural	Girl—trafficking	Sexual abuse	Girl	Gender equality—employment	Sex and gender	Sex trafficking	Sexual abuse	Personal security	Armed conflict
SR Migrants	Refugees and asylum seekers	Procedural	Migrant workers—trafficking	Labor—migrants	Business	Migrant workers—civil and social rights	Police and detention	Sex trafficking	Liberty prevention	Financial
CCPR	Torture and detention	Sex and gender	Torture	Freedom of assembly	Girl—trafficking	Refugees and asylum seekers	Detention	Race—ethnic	Migrant workers—civil and social rights	Judiciary

(Continued)

Appendix 2. Continued

	1	2	3	4	5	6	7	8	9	10
SR Trafficking	Sex trafficking	Procedural	Labor—migrants	Refugees and asylum seekers	Migrant workers—trafficking	Police and detention	Race	Slavery	Judiciary	Liberty prevention
CRC	Juvenile	Pornography	Girl	Sex trafficking	Torture and detention	Girl—trafficking	Torture	Poverty—water and food	Sex and gender	Sex and gender Juvenile
CESCR	Poverty—water and food	Girl—trafficking	Sex and gender	Gender equality—employment	Poverty—housing and income	Migrant workers—civil and social rights	Race—ethnic	Disability		
CEDAW	Girl—trafficking	Gender equality—employment	Girl	Migrant workers—civil and social rights	Procedural	Sex and gender	Sex trafficking	Internally displaced persons	Personal security	Refugees and asylum seekers
SR Minorities	Minority—cultural rights	Procedural	Land and housing	Freedom of assembly	Education	Terrorism	Race	Internally displaced persons	Race—African descent	
SR Sale of children	Procedural	Sex trafficking	Pornography	Juvenile	Girl	Education	Business	Detention	Refugees and asylum seekers	Race—ethnic
CMW	Migrant workers—trafficking	Labor—migrants	Refugees and asylum seekers	Sex and gender	Sex trafficking	Procedural	Torture and detention	Pornography	Juvenile	
CERD	Race—ethnic	Indigenous rights	Minority—cultural rights	Migrant workers—civil and social rights	Refugees and asylum seekers	Race	Race—African descent	Land and housing	Minority	Education
SR Counteracting terrorism	Terrorism	Torture and detention	Detention	Transitional Justice	Personal security	Judiciary	Use of military force	Armed conflict	General recommendations	
CAT	Torture	Torture and detention	Detention	Refugees and asylum seekers	Sex and gender	Transitional Justice	Police killing	Enforced disappearances II	Use of military forces	
CRC-OP-SC	Sex trafficking	Pornography	Criminal procedure and due process	Juvenile	Girl—trafficking	Refugees and asylum seekers	Armed conflict—child soldiers	Use of military force	Business	
SR Racism	Procedural	Race	Terrorism	Minority—cultural rights	Minority	Refugees and asylum seekers	Race—ethnic	Poverty—housing and income	Labor—migrants	
SR Health	Procedural	Health	Poverty—water and food	Financial	Juvenile	Sex and gender	Nuclear Disaster	Disability	Refugees and asylum seekers	
SR Torture	Detention	Police and detention	Torture and detention	Procedural	Prisoners	Freedom of Religion	Torture	Refugees and asylum seekers	Personal security	

(Continued)

Appendix 2. Continued

	1	2	3	4	5	6	7	8	9	10
SR Summary executions UJR	Police killing Review of human rights	Procedural General recommendations	Armed conflict Minority	Terrorism Death penalty II	Torture and detention Personal security	Transitional Justice—Freedom of expression	Detention Migrant workers—civil and social rights	Death penalty II Death penalty I	Police and detention Sex and gender	Use of military force Freedom of assembly
SPT	Liberty prevention	Detention	Procedural	Prisoners	Police and detention	Terrorism	Refugees and asylum seekers	Judiciary	Torture	Police killing
IE Foreign debt	Financial	Procedural	Poverty—water and food Procedural	Business	Poverty—housing and income Police killing	Freedom of assembly Freedom of Religion	Judiciary	Terrorism	Land and housing	General recommendations Sex and gender
SR Freedom of expression SR Extreme poverty	Freedom of assembly	Terrorism	Poverty—water and food and income	Police killing	Girl—trafficking	Independence recommendations	Judiciary	Freedom of expression Minority—cultural rights	Land and housing	General recommendations Sex and gender
SR Water & sanitation SR HR Defenders	Poverty—water and food Freedom of assembly	Procedural	Financial	Environment pollution	Business	Girl	Land and housing	Indigenous rights	Liberty prevention	Poverty—housing and income
SR Slavery	Procedural	Police killing	Procedural	Terrorism	Freedom of expression	Personal security	Judiciary	Transitional Justice Business	General recommendations Juvenile	Liberty prevention Police and detention
WG People of african descent	Race—African descent	Slavery	Labor—migrants	Sex trafficking	Poverty—water and food	Migrant workers—trafficking	Refugees and asylum seekers	Detention	Race—ethnic	Minority—cultural rights
SR Cultural rights	Education	Procedural	Race	Terrorism	Education	Poverty—housing and income	Indigenous rights	Disability	Minority	Minority—cultural rights
CRPD	Disability	Girl	Procedural	Minority—cultural rights	Land and housing	Freedom of Religion	Freedom of assembly	Gender equality—employment and income	Poverty—housing and income	Torture
SR Assembly & association SR IDPs	Freedom of assembly Internally displaced persons	Procedural	Terrorism	Business	Education	Gender equality—employment and income	Police and detention Labor—migrants	Juvenile	Freedom of Religion Education	Sex and gender
WG Women & girls	Procedural	Gender equality—employment	Land and housing Girl—trafficking	Poverty—housing and income Sex and gender	Financial	Terrorism	Financial	Poverty—housing and income	Poverty—migrants	Gender equality—employment Poverty—water and food
SR Truth, justice, reparation	Transitional Justice	Procedural	Terrorism	Judiciary	Education	Migrant workers—civil and social rights	Education	Judiciary	Personal security independence	Torture and detention

(Continued)

Appendix 2. Continued

WG Transnational corporations	Business	Procedural	Land and housing	Indigenous rights	Financial	Sex and gender	Freedom of assembly	Gender equality—employment	Labor—migrants	Police killing
CED	Enforced disappearances II	Use of military force	Criminal procedure and due process	Enforced disappearances I	Detention	Torture	Procedural	Transitional Justice	Refugees and asylum seekers	Torture and detention
SR Environment	Procedural	Environment pollution	Land and housing	Terrorism	Financial	Poverty—water and food	Freedom of assembly	Indigenous rights	Business	Girl
IE Older persons	Terrorism	Disability	Poverty—water and food	Procedural	Poverty—housing and income	Juvenile	Gender equality—employment	Girl	Education	Liberty prevention
SR Persons with disability	Disability	Procedural	Poverty—housing and income	Education	Review of human rights	Terrorism	Gender equality—employment	Transitional Justice	Liberty prevention	Health
IE International solidarity	Financial	Procedural	Girl	Poverty—water and food	Death penalty I	Education	Refugees and asylum seekers	Freedom of assembly	Terrorism	Migrant workers—trafficking
SR Unilateral coercive measures	Freedom of assembly	Procedural	Poverty—water and food	Financial	Business	Internally displaced persons	Terrorism	Personal security	Criminal procedure and due process	Torture
IE Sexual Orientation & gender identity	Sex and gender	Procedural	Gender equality—employment	Minority	Terrorism	Girl	Judiciary independence	Education	Freedom of Religion	Sextrafficking
IE Democratic and equitable international order	Procedural	Financial	Freedom of assembly	Personal security	General recommendations	Poverty—water and food	Terrorism	Use of military force	Transitional Justice	Indigenous rights
IE Albinism	Procedural	Police killing	Disability	Girl	Education	Poverty—water and food	Juvenile	Gender equality—employment	Sex trafficking	Financial
SR Development	Procedural	Poverty—water and food	Financial	Gender equality—employment	Girl	Education	Disability	Judiciary	General recommendations	Poverty—housing and income

Appendix 3. Annual changes in topic appearances

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
0	Transitional justice	0.096	0.136	0.127	0.127	0.116	0.126	0.151	0.102	0.132	0.156	0.153	0.138	0.153	0.153
1	Nuclear Disaster	0.024	0.016	0.014	0.025	0.017	0.019	0.018	0.019	0.016	0.030	0.014	0.037	0.014	0.059
2	Use of military force	0.224	0.131	0.159	0.110	0.108	0.135	0.131	0.156	0.122	0.090	0.142	0.135	0.097	0.035
3	Terrorism	0.248	0.283	0.227	0.216	0.164	0.174	0.149	0.127	0.196	0.165	0.108	0.153	0.161	0.176
4	Slavery	0.024	0.052	0.050	0.055	0.047	0.039	0.072	0.028	0.033	0.049	0.028	0.042	0.028	0.012
5	Labor—migrants	0.104	0.152	0.091	0.119	0.134	0.106	0.126	0.146	0.143	0.139	0.179	0.130	0.138	0.141
6	Migrant workers—trafficking	0.112	0.141	0.136	0.157	0.194	0.254	0.246	0.212	0.217	0.188	0.150	0.165	0.149	0.141
7	Migrant workers—civil and social rights	0.184	0.230	0.214	0.195	0.254	0.250	0.242	0.198	0.226	0.294	0.271	0.283	0.251	0.118
8	Refugees and asylum seekers	0.216	0.199	0.155	0.208	0.250	0.242	0.194	0.145	0.153	0.113	0.143	0.154	0.123	0.247
9	Land and housing	0.104	0.147	0.159	0.186	0.194	0.145	0.145	0.121	0.203	0.230	0.208	0.184	0.165	0.129
10	Criminal procedure and due process	0.200	0.304	0.195	0.195	0.121	0.250	0.208	0.168	0.164	0.266	0.203	0.233	0.147	0.094
11	Judiciary	0.176	0.178	0.250	0.208	0.140	0.155	0.155	0.180	0.151	0.127	0.147	0.132	0.135	0.200
12	Freedom of Religion	0.088	0.162	0.186	0.186	0.123	0.106	0.134	0.184	0.140	0.160	0.163	0.165	0.130	0.141
13	Poverty—housing and income	0.064	0.136	0.064	0.122	0.177	0.177	0.258	0.250	0.266	0.279	0.236	0.245	0.293	0.176
14	Poverty—water and food	0.120	0.272	0.120	0.120	0.100	0.089	0.108	0.072	0.086	0.042	0.090	0.094	0.198	0.082
15	Race	0.080	0.131	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
16	Null	0.112	0.173	0.150	0.182	0.134	0.126	0.135	0.090	0.135	0.173	0.127	0.116	0.111	0.200
17	Police killing	0.032	0.042	0.036	0.089	0.052	0.068	0.054	0.071	0.078	0.079	0.090	0.051	0.088	0.082
18	Race—African descent	0.008	0.026	0.014	0.038	0.022	0.048	0.014	0.005	0.008	0.023	0.038	0.023	0.005	0.012
19	Indigenous—regulation	0.056	0.073	0.045	0.038	0.065	0.034	0.054	0.047	0.065	0.049	0.066	0.070	0.065	0.094
20	Health	0.192	0.204	0.241	0.233	0.297	0.232	0.225	0.231	0.212	0.218	0.156	0.163	0.240	0.235
21	Education	0.008	0.021	0.014	0.025	0.026	0.043	0.027	0.099	0.057	0.030	0.024	0.033	0.014	0.071
22	Environment pollution	0.072	0.042	0.045	0.042	0.047	0.043	0.045	0.033	0.053	0.038	0.047	0.051	0.051	0.024
23	Enforced disappearances ¹	0.104	0.095	0.081	0.060	0.082	0.059	0.066	0.033	0.071	0.052	0.019	0.046	0.059	0.059
24	Armed conflict	0.184	0.157	0.186	0.195	0.203	0.232	0.194	0.189	0.241	0.199	0.170	0.209	0.207	0.224
25	Freedom of assembly	0.064	0.110	0.123	0.068	0.112	0.068	0.104	0.099	0.049	0.060	0.052	0.084	0.074	0.047
26	Prisoners	0.040	0.094	0.091	0.085	0.121	0.072	0.054	0.094	0.065	0.038	0.080	0.065	0.097	0.094
27	Death penalty I	0.064	0.089	0.064	0.085	0.091	0.059	0.140	0.108	0.135	0.165	0.170	0.186	0.175	0.271
28	Business	0.096	0.141	0.145	0.186	0.172	0.213	0.252	0.292	0.306	0.376	0.392	0.395	0.419	0.471
29	Sex and gender	0.040	0.068	0.023	0.021	0.022	0.024	0.018	0.009	0.020	0.034	0.019	0.014	0.005	0.012
30	Jurisdiction	0.160	0.209	0.255	0.161	0.207	0.222	0.252	0.241	0.192	0.211	0.245	0.181	0.184	0.106
31	Torture	0.040	0.068	0.177	0.144	0.177	0.159	0.162	0.189	0.163	0.188	0.198	0.195	0.203	0.259
32	Freedom of expression	0.120	0.110	0.186	0.148	0.151	0.140	0.158	0.175	0.159	0.162	0.170	0.242	0.175	0.176
33	Personal security	0.088	0.089	0.159	0.072	0.103	0.101	0.131	0.108	0.131	0.071	0.071	0.144	0.083	0.141
34	Judiciary independence														

(Continued)

Appendix 3. Continued

		2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
35	Sex trafficking	0.128	0.136	0.191	0.203	0.228	0.203	0.230	0.203	0.269	0.267	0.226	0.270	0.281	0.271
36	Detention	0.216	0.246	0.273	0.216	0.254	0.203	0.203	0.217	0.188	0.231	0.186	0.212	0.094	
37	Pornography	0.232	0.298	0.295	0.336	0.216	0.261	0.216	0.203	0.127	0.068	0.090	0.037	0.046	0.035
38	Review of human rights	0.064	0.047	0.082	0.119	0.207	0.140	0.189	0.226	0.192	0.199	0.137	0.251	0.235	0.353
39	Juvenile	0.112	0.126	0.168	0.199	0.237	0.213	0.239	0.208	0.237	0.267	0.222	0.181	0.203	0.259
40	Race—ethnic	0.152	0.272	0.227	0.191	0.228	0.198	0.198	0.160	0.167	0.162	0.189	0.126	0.157	0.153
41	Disability	0.040	0.037	0.059	0.064	0.142	0.135	0.216	0.189	0.159	0.267	0.264	0.256	0.336	0.353
42	Girl	0.048	0.031	0.068	0.085	0.116	0.101	0.171	0.175	0.278	0.342	0.387	0.395	0.530	0.565
43	Torture and detention	0.232	0.236	0.305	0.280	0.246	0.256	0.288	0.253	0.252	0.344	0.298	0.240	0.082	
44	Gender equality—employment	0.240	0.168	0.132	0.110	0.147	0.130	0.185	0.170	0.220	0.256	0.255	0.270	0.304	0.353
45	Procedural	0.448	0.455	0.428	0.466	0.372	0.342	0.255	0.339	0.301	0.203	0.223	0.226	0.435	
46	Sexual abuse	0.088	0.084	0.109	0.076	0.073	0.130	0.041	0.071	0.045	0.079	0.052	0.060	0.041	0.035
47	Minority	0.024	0.152	0.150	0.131	0.147	0.116	0.158	0.156	0.151	0.147	0.132	0.172	0.221	0.282
48	Enforced disappearances II	0.072	0.042	0.059	0.064	0.047	0.097	0.059	0.080	0.102	0.068	0.113	0.093	0.046	0.059
49	Girl trafficking	0.384	0.366	0.341	0.271	0.315	0.348	0.306	0.302	0.278	0.393	0.250	0.256	0.184	0.106
50	Police and detention	0.112	0.115	0.077	0.089	0.099	0.097	0.068	0.028	0.090	0.068	0.057	0.019	0.060	0.059
51	Armed conflict—child soldiers	0.152	0.115	0.123	0.144	0.069	0.082	0.108	0.094	0.102	0.090	0.118	0.102	0.074	0.094
52	Indigenous rights	0.096	0.126	0.159	0.153	0.159	0.130	0.122	0.123	0.110	0.173	0.156	0.140	0.134	0.165
53	Internally displaced persons	0.088	0.089	0.164	0.148	0.129	0.101	0.104	0.165	0.143	0.162	0.151	0.116	0.147	0.118
54	Legislative	0.080	0.079	0.086	0.055	0.086	0.092	0.063	0.052	0.073	0.056	0.061	0.051	0.037	0.035
55	General recommendations	0.176	0.346	0.336	0.280	0.353	0.246	0.207	0.250	0.139	0.132	0.042	0.093	0.060	0.012
56	Death penalty II	0.080	0.157	0.123	0.144	0.263	0.116	0.131	0.122	0.109	0.047	0.069	0.069	0.165	
57	Financial	0.136	0.079	0.118	0.140	0.125	0.140	0.086	0.052	0.082	0.128	0.085	0.135	0.111	0.910
58	Minority—cultural rights	0.020	0.225	0.223	0.208	0.207	0.232	0.153	0.153	0.080	0.147	0.106	0.126	0.141	
59	Liberty prevention	0.088	0.110	0.114	0.093	0.108	0.072	0.113	0.099	0.060	0.090	0.093	0.093	0.101	0.106