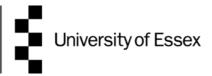# The Universal Declaration of Human Rights at 70

Putting Human Rights at the Heart of the Design, Development and Deployment of Artificial Intelligence

ESRC ECONOMIC & SOCIAL RESEARCH COUNCIL

Human Rights Centre | University of Essex

The Human Rights, Big Data and Technology Project

70 YEARS UNIVERSAL DECLARATION OF HUMAN RIGHTS #STANDUP4HUMANRIGHTS

THE UNIVERSAL DECLARATION OF HUMAN RIGHTS AT 70

PUTTING HUMAN RIGHTS AT THE HEART OF THE
DESIGN, DEVELOPMENT, AND DEPLOYMENT
OF ARTIFICIAL INTELLIGENCE

20 December 2018

The Human Rights, Big Data and Technology Project

CONTENTS

About the Human Rights, Big Data and Technology Project

The Human Rights, Big Data and Technology Project (HRBDT) began in 2015 with £5 million funding from the Economic and Social Research Council and further funding from the University of Essex. One of the largest of its kind in the world, the Project is based at the Human Rights Centre at the University of Essex with over 30 academics, and additional researchers based at Cambridge University, the Geneva Academy and Queen Mary University London, in disciplines including computer science, economics, law, philosophy, political science, and sociology.

The core objective of HRBDT is to identify and assess the risks and opportunities for human rights posed by big data and artificial intelligence and to propose solutions to ensure that new and emerging technologies are designed, developed, deployed and regulated in a way that is enabling of, rather than threatening to, human rights. HRBDT's research assesses the adequacy of existing ethical and regulatory approaches to big data and artificial intelligence from a human rights perspective. HRBDT's research also demonstrates how human rights standards are capable of adapting, and offering solutions to, rapidly evolving technological landscapes.

We engage with responses to the risks and opportunities posed by big data and artificial intelligence at the multilateral and multi-stakeholder level; within specific sectors, such as in the law enforcement, health and humanitarian sectors; as well as at the national level in states such as Brazil, Germany, India, the UK and the US. Focused on providing evidence-based and innovative research to support decision-making in policy, regulatory and commercial settings, HRBDT engages with both national and international actors including the Office of the UN High Commissioner for Human Rights, the Office of the UN High Commissioner for Refugees, national bodies, agencies and organisations, and businesses, and works in partnership with a range of civil society organisations in the UK and internationally.

EXECUTIVE SUMMARY

Big data and artificial intelligence (AI) greatly affect the enjoyment of all fundamental rights and freedoms enshrined in the Universal Declaration of Human Rights (UDHR). These new technologies offer significant opportunities for the advancement of human rights across many areas of life, including by facilitating more personalised education and assisting people in later life to live a dignified life at home. At the same time, however, the use of big data and AI has the potential to undermine or to violate human rights protections. For example, the use of these technologies can affect a range of sectors and areas of life, such as education, work, social care, health and law enforcement, and can negatively impact groups in positions of vulnerability, such as refugees, asylum-seekers and older persons. The use of big data and AI can also threaten the right to equality, the prohibition of discrimination and the right to privacy. These rights can act as gatekeepers for the enjoyment of other fundamental rights and freedoms, and interferences in this regard may hinder the development of individuals' identity and agency, potentially undermining the basis of participatory democracy.

Inspired by the UDHR, this report recommends that in order to effectively respond to the potential and challenges of big data and AI, states and businesses should apply a human-rights based approach (HRBA) to existing and future applications of these technologies. An HRBA provides a common language to frame harms, offering clear parameters as to what is and is not permitted under international human rights law, both for state and non-state actors. Specific human rights principles such as accessibility, affordability, avoidance of harm, and intellectual freedom can also contribute to addressing issues of marginalisation, discrimination and the digital divide. At the heart of the development and use of big data and AI should be the right to benefit from scientific progress (Article 27 UDHR). This can help to ensure that the emergence of new technology serves societal goals.

This report sets out how an HRBA can underpin the design, development and deployment of big data and AI. We argue that it needs to be applied in two ways:

- **Applying an HRBA to Existing Uses of AI**

Big data and AI are already being used in a range of situations that have the potential to affect human rights. Actors that are currently designing, developing and using these technologies need to apply an HRBA to their work. This requires transparency to where, when, how and why big data and AI are being used. It also requires

ongoing human rights impact assessments to determine whether their existing uses of big data and AI are impacting on human rights and the establishment of accountability and independent oversight processes. Individuals and groups also need to be notified of harm and have access to an effective remedy. An effective remedy should ensure three key elements: prevention, redress and non-recurrence. In the context of big data and AI, remedy should rectify flaws in the system and provide redress to any affected individuals.

- **Embedding an HRBA in AI Policies, Strategies and Regulation**

States and businesses are beginning to examine how individual and societal harm by AI might be addressed through dedicated policies, strategies and potential regulation.[1] In our view, the HRBA should sit at the heart of the future design, development and deployment of these technologies and the regulation of the AI sector, in whatever form this takes.

A multilateral and multi-stakeholder approach is required to address issues arising in the context of big data and AI. This report argues that an HRBA is an effective vehicle to bring together the different actors active in this field, including states, business enterprises, and civil society, in order to address the challenges and opportunities presented by big data and AI. The objective is to ensure that technological developments serve societal interests, and contribute towards the protection and promotion of human rights for all.

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[1] See, for example, Partnership on AI, available at <https://www.partnershiponai.org/>; Australia Human Rights Commission, Human Rights and Technology Issues Paper, July 2018, available at <https://www.humanrights.gov.au/sites/default/files/document/publication/AHRC-Human-Rights-Tech-IP.pdf>; Government of Canada, Treasury Board of Canada Secretariat, Responsible Artificial Intelligence in the Government of Canada: Digital Disruption White Paper Series (Version 2.0, 10 April 2018), available at <https://docs.google.com/document/d/1Sn-qBZUXEUG4dVk909eSg5qvfbpNlRhzIefWPtBwbxY/edit>, 24; World Economic Forum, White Paper, How to Prevent Discriminatory Outcomes in Machine Learning, March 2018.

INTRODUCTION

This year marks the 70th anniversary of the Universal Declaration of Human Rights (UDHR).[2] The UDHR sets out 28 rights to which every individual is entitled on an equal and inalienable basis. In her address to the United Nations (UN) General Assembly this year, the UN High Commissioner for Human Rights, Michelle Bachelet, reflected that the UDHR has 'empowered millions to march, to come together and to build progress'. She observed that, '[w]e still have a long way to go, but in the past 70 years, humanity has moved a thousand steps forward'.[3]

This year marks an important point at which to celebrate and take stock of the profound achievements of the UDHR. As the foundation of the modern international human rights system, the UDHR has inspired a range of human rights treaties, national legislation, and the establishment of international, regional and national institutions designed to promote and protect human rights.[4] It has empowered people across the world to claim their rights, access justice and receive redress, and has played a key role in preventing human rights violations, and ensuring accountability. Human rights provide a legal basis and 'shared moral touchstone' for assessing policies and practices and are a basis for aspirational political action.[5]

However, these achievements are under threat. As recognised by the UN High Commissioner for Human Rights, '[i]n many countries, the fundamental recognition that all human beings are equal, and have inherent rights, is under attack. And the institutions set up by states to achieve common solutions are being undermined'.[6] Uneven compliance with human rights obligations, persistent impunity for many egregious human rights violations and the need to address growing inequality in all societies remains a serious concern.[7] Looking forward, the UN High

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[2] Universal Declaration of Human Rights (UDHR) (10 Dec. 1948), U.N.G.A. Res. 217 A (III) (1948), available at <http://www.un.org/en/universal-declaration-human-rights/>.

[3] Michelle Bachelet, UN High Commissioner for Human Rights, 'The UDHR: A prevention tool to achieve peace and sustainable development', High level side event, 26 September 2018, available at <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=23640&LangID=E>.

[4] UN, The Foundation of International Human Rights Law, available at < http://www.un.org/en/sections/universal-declaration/foundation-international-human-rights-law/index.html>.

[5] Charles Beitz, *The Idea of Human Rights* (OUP 2009) xi and 44.

[6] Michelle Bachelet, UN High Commissioner for Human Rights, Statement for the 70th Anniversary of the Universal Declaration of Human Rights, available at <https://www.ohchr.org/en/newsevents/pages/media.aspx>. See also António Guterres, UN Secretary-General, Remarks at the Security Council Open Debate on "Strengthening Multilateralism and the Role of the United Nations", 9 November 2018, available at <https://www.un.org/sg/en/content/sg/speeches/2018-11-09/strengthening-multilateralism-and-role-un-remarks-security-council>.

[7] UN, Office of the UN High Commissioner for Human Rights, Human Rights Report 2017, available at <https://www2.ohchr.org/english/OHCHRreport2017/allegati/Downloads/1_Whole_Report_2017.pdf>; UN, The Sustainable Development Goals Report 2018, available at <https://unstats.un.org/sdgs/files/report/2018/TheSustainableDevelopmentGoalsReport2018-EN.pdf>.

Commissioner argued that the solution lies in placing human rights at the centre as 'the interlocking elements that build resilient and confident societies'.[8]

Big data and artificial intelligence have been presented as offering some solutions to these and other challenges faced by the human rights system.[9] Big data typically refer to large datasets, analysed with advanced computational processing techniques.[10] These data are increasingly used to feed into algorithmic decision-making systems that can learn new rules and perform tasks with varying degrees of human involvement. The increasing automation and capabilities of systems to learn and perform complex tasks at speed and scale is also known as artificial intelligence (AI).[11] Such technologies have the potential to provide new ways to promote and protect human rights. For example, they may be used to document human rights violations;[12] implement the Sustainable Development Goals;[13] respond more effectively to the refugee 'crisis';[14] and manage the impacts of

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[8] Michelle Bachelet, UN High Commissioner for Human Rights, 'The UDHR: A prevention tool to achieve peace and sustainable development', High level side event, 26 September 2018, available at <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=23640&LangID=E>.

[9] See, for example, UN Global Pulse and Office of the UN High Commissioner for Refugees Innovation Service, 'Social Media and Forced Displacement: Big Data Analytics & Machine-Learning' (White Paper, September 2017) available at <https://www.unglobalpulse.org/sites/default/files/White%20Paper%20Social%20Media%203_0.pdf>; UN Secretary-General Independent Expert Advisory Group on a Data Revolution for Sustainable Development, 'A World That Counts: Mobilising the Data Revolution for Sustainable Development' (2014) available at <http://wedocs.unep.org/bitstream/handle/20.500.11822/20065/ieag_world.pdf?sequence=1&isAllowed=y> ; International Telecommunication Union, 'Artificial Intelligence for Global Good' (2018) available at <https://www.itu.int/en/itunews/Documents/2018/2018-01/2018_ITUNews01-en.pdf>; International Telecommunication Union, 'United Nations Activities on Artificial Intelligence' (2018), available at <https://www.itu.int/dms_pub/itu-s/opb/gen/S-GEN-UNACT-2018-1-PDF-E.pdf>; Diplo Foundation, 'Data Diplomacy: Updating Diplomacy to the Big Data Era' (February 2018), sections 2.3 and 2.5, available at https://www.diplomacy.edu/sites/default/files/Data_Diplomacy_Report_2018.pdf; UN Global Pulse and UN Development Programme, 'A Guide to Data Innovation for Development: From Idea to Proof-of-Concept' (December 2016), available at http://unglobalpulse.org/sites/default/files/UNGP_BigDataGuide2016_%20Web.pdf; UN Global Pulse and IAPP, 'Building Ethics into Privacy Frameworks for Big Data and AI' (22 October 2018), available at https://iapp.org/media/pdf/resource_center/BUILDING-ETHICS-INTO-PRIVACY-FRAMEWORKS-FOR-BIG-DATA-AND-AI-UN-Global-Pulse-IAPP.pdf, Global e-Sustainability Initiative, '#EnablingRights: The Transformative Potential of Digital to Enable People's Rights' (2018), available at <https://gesi.org/uploads/2018/05/enabling-rights-overview-web-version.pdf>.

[10] See, for example, Rob Kitchin and Gavin McArdle, 'What makes Big Data, Big Data? Exploring the ontological characteristics of 26 datasets' (2016) 3(1) Big Data & Society 1 for discussion on the diverse nature of big data.

[11] AI is often used in a broadbrush manner to refer to various associated technical capabilities, and in inaccurate ways. The lack of distinction between aspirational general AI and the current state of narrow AI, also tends to contribute to the hype and fear around AI. See for example, UK House of Lords Select Committee on Artificial Intelligence, 'AI in the UK: ready, willing, able?', Report of Session 2017-19, HL (16 April 2018), available at <https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf>, 39-46; Oscar Schwartz, ''The discourse is unhinged': how the media gets AI alarmingly wrong' *The Guardian* (London, 25 July 2018), available at <https://www.theguardian.com/technology/2018/jul/25/ai-artificial-intelligence-social-media-bots-wrong>; Karen Hao, 'Is this AI? We drew you a flowchart to work it out' (*MIT Technology Review*, 10 November 2018), available at <https://www.technologyreview.com/s/612404/is-this-ai-we-drew-you-a-flowchart-to-work-it-out/>.

[12] Christoph Koettl, 'Satellite Images and Shadow Analysis: How The Times Verifies Eyewitness Videos' *The New York Times* (New York, 4 September 2018), available at <https://www.nytimes.com/2018/09/04/reader-center/social-media-video-how-to-verify.html>; Amnesty International, Benetech, and The Engine Room, "DatNav: how to navigate digital data for human rights research", 24 August 2016, available at <https://www.theengineroom.org/wp-content/uploads/2017/01/en-datnav-report_high-quality_web_.pdf>; Amnesty International, 'Decode The Difference', available at <https://decoders.amnesty.org/projects/decode-the-difference>; Amnesty International, 'Decode Oil Spills', available at <https://decoders.amnesty.org/projects/decode-oil-spills>; Amnesty International, 'Strike Tracker', available at <https://decoders.amnesty.org/projects/strike-tracker>; Amnesty International, 'Troll Patrol', available at <https://decoders.amnesty.org/projects/troll-patrol>.

[13] Joint Meeting of ECOSOC and the Second Committee on "The Future of Everything – Sustainable Development in the Age of Rapid Technological Change", 11 October 2017; International Telecommunication Union, 'Fast-forward progress: Leveraging tech to achieve the global goals', 13 July 2017, available at <https://www.itu.int/en/sustainable-world/Documents/Fast-forward_progress_report_414709%20FINAL.pdf>; International

climate change.[15] They potentially offer innovative ways in which to realise the rights set out in the UDHR such as enhancing access to education, enabling persons with disabilities and older persons to live more autonomously, advancing the right to the highest attainable standard of health, and providing ways to tackle human trafficking,[16] and forced labour.[17] However, the best case scenarios of such applications do not happen by default.

At the same time, the use of big data and AI can present significant risks to human rights, even in contexts where they are used with the intention to advance them. They can introduce new threats and aggravate and amplify existing challenges to human rights, for example by reducing accountability for rights violations due to opaque decision-making processes, and by widening inequality. This could be due to factors such as uneven distribution of benefits, discriminatory impacts and biased datasets. Big data and AI have wide ranging effects across society and individuals' lives, including collective impact, many of which are not yet fully understood. They can put the full spectrum of human rights – civil, cultural, economic, political and social – at risk.

Telecommunication Union and XPRIZE Foundation, AI for Good Global Summit Report, available at <https://www.itu.int/en/ITU-T/AI/Documents/Report/AI_for_Good_Global_Summit_Report_2017.pdf>; UN Global Pulse, The Sustainable Development Goals (SDGs) Projects, available at <https://www.unglobalpulse.org/programme-type/sustainable-development-goals-sdgs>; UN Department of Economic and Social Affairs, Global Sustainable Development Report 2016, Chapter 3 "Perspectives of scientists on technology and the SDGs", available at <https://sustainabledevelopment.un.org/content/documents/2328Global%20Sustainable%20development%20report%202016%20(final).pdf>.

[14] UN Global Pulse, 'Using Big Data and Machine Learning to Respond to the Refugee Crisis in Uganda', 5 March 2018, available at <https://www.unglobalpulse.org/news/using-big-data-and-machine-learning-respond-refugee-crisis-uganda>; Office of the UN High Commissioner for Refugees, 'How artificial intelligence can be used to predict Africa's next migration crisis', Innovation Service, 10 February 2017, available at <http://www.unhcr.org/innovation/how-artificial-intelligence-can-be-used-to-predict-africas-next-migration-crisis/>; Immigration Policy Lab, 'Harnessing Big Data to Improve Refugee Resettlement', available at <https://immigrationlab.org/project/harnessing-big-data-to-improve-refugee-resettlement/>.

[15] Nicola Jones, 'How machine learning could help to improve climate forecasts' (*Nature,* 23 August 2017), available at <https://www.nature.com/news/how-machine-learning-could-help-to-improve-climate-forecasts-1.22503>; Ben Schwartz, 'How Can AI Help to Prepare for Floods in a Climate-Changed World?' (*Scientific American*, 13 September 2018), available at <https://www.scientificamerican.com/article/former-fema-chief-uses-ai-to-prepare-for-hurricanes-and-rising-seas/>.

[16] See, for example, RESPECT Initiative, 'The Responsible and Ethical Private Sector Coalition against Trafficking', available at <www.respect.international>; Peter Nestor, Dunstan Allison-Hope and Hannah Darnton, 'Announcing a New Collaboration Using Tech to Combat Human Trafficking' (London, 28 June 2018), available at <https://www.bsr.org/en/our-insights/blog-view/announcing-a-new-collaboration-using-tech-to-combat-human-trafficking>; Mark Latonero, Bronwyn Wex and Meredith Dank, 'Technology and Labor Trafficking in a Network Society (February 2015), available at <https://communicationleadership.usc.edu/files/2015/10/USC_Tech-and-Labor-Trafficking_Feb2015.pdf>; Jennifer Zaino, 'Case Study: Polaris Puts Data Analysis in the Service of Defeating Human Trafficking' (*Dataversity*, 18 January 2018), available at <http://www.dataversity.net/case-study-polaris-puts-data-analysis-service-defeating-human-trafficking/>; Renata et al, 'Overcoming human trafficking via operations research and analytics: Opportunities for methods, models, and applications' (2017) 259(2) European Journal of Operational Research 733.

[17] UK Independent Anti-Slavery Commissioner, 'Strategic Plan 2015-2017' (October 2015), 21, available at <https://www.antislaverycommissioner.co.uk/media/1075/iasc_strategicplan_2015.pdf> Doreen S. Boyd et al., 'Slavery from Space: Demonstrating the role of satellite remote sensing to inform evidence-based action related to UN SDG number 8' (2018) 124 ISPRS Journal of Photogrammetry and Remote Sensing 280.

This report by the Human Rights, Big Data and Technology project (HRBDT)[18] starts by illustrating the ways in which all rights set out in the UDHR can be affected by big data and AI. As equality and non-discrimination, and privacy are often the rights referred to in the context of big data and AI, we first address how these are impacted. We then show how the use of big data and AI in key sectors with high impact, such as education, law enforcement, healthcare, work, social care of the elderly and in relation to refugees can both advance and threaten a range of rights in the UDHR as well as affect our core identity.

The celebration of the UDHR's anniversary comes at an important moment in the application of international human rights law (IHRL) to the regulation of big data and AI. In our view, it is critical that the UDHR, and the international human rights system as a whole, underpin the governance of these technologies. This is both in order to address the risks to human rights but also to ensure that we are all able to benefit from scientific progress as a human rights entitlement recognised in article 27 of the UDHR. In the final part, we set out how states, businesses and civil society can address the impact big data and AI have on human rights. We then propose that the future design, development and deployment of AI, as well as the regulation of the AI sector, should be grounded in a human rights-based approach (HRBA). As the UN High Commissioner for Human Rights reaffirmed in her statement on the 70th anniversary of the UDHR, '[t]he Universal Declaration gives us the principles we need to govern artificial intelligence and the digital world'.[19]

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[18] The Human Rights, Big Data and Technology Project is an ESRC funded project based at the University of Essex, which analyses the challenges and opportunities presented by the use of big data, artificial intelligence and associated technologies from a human rights perspective. See https://hrbdt.ac.uk/.

[19] Michelle Bachelet, UN High Commissioner for Human Rights, Statement, '70th Anniversary of the Universal Declaration of Human Rights', 6 December 2018, available at <https://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=23983&LangID=E>.

I.   THE IMPACT OF BIG DATA AND AI ON HUMAN RIGHTS

The development and use of big data and AI have the potential to affect all human rights.[20] The Vienna Declaration, adopted by consensus at the end of the World Conference on Human Rights in 1993 underscored the universality, indivisibility, interdependence and interrelatedness of all human rights.[21] Looking at big data and AI through the lens of the UDHR clearly shows the wide-ranging effects of these technologies across all human rights, as demonstrated in this part of the report.

A. The Rights to Equality, Non-Discrimination and Privacy as Gatekeepers to All Human Rights

The human rights impact of big data and AI is often described in terms of the risks posed to privacy and equality and non-discrimination. These rights are routinely put at risk by big data and AI. Inequality and interferences with the prohibition of discrimination and the right to privacy can also provide a gateway to the violation of other rights. In this sense, privacy and equality and non-discrimination can act as 'gatekeepers' to the enjoyment of other human rights.[22] This fundamental role tends to be underplayed but is of central importance in the context of big data and AI.

1.   The Rights to Equality and Non-Discrimination

The rights to equality before the law and non-discrimination are foundational to the UDHR; they are the first two rights set out in the Declaration.[23] Building on the Preamble, they emphasise that '[a]ll human beings are born free and equal in dignity and rights'[24] and to this end prohibit unlawful discrimination. The UDHR provides that

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[20] For a study on the impact of algorithms on specific rights, see, for example, Council of Europe Committee of Experts on Internet Intermediaries (MSI-NET), 'Algorithms and Human Rights: Study on the Human Rights Dimensions of Automated Data Processing Techniques and Possible Regulatory Implications' (March 2018) Study DGI(2017)12.

[21] UN General Assembly, Vienna Declaration and Programme of Action, 12 July 1993, A/CONF.157/23, paragraph 5.

[22] See UN Human Rights Council, Resolution on 'The right to privacy in the digital age', UN Doc. A/HRC/34/7, 19 December 2016; UN General Assembly, Resolution on 'The right to privacy in the digital age', UN Doc. 68/167, 18 December 2013; and David Kaye, UN Special Rapporteur on Freedom of Expression, Annual report 2015, UN Doc. A/HRC/29/32, 22 May 2015.

[23] UN, Office of the UN High Commissioner for Human Rights, Fact Sheet No. 2 (Rev.1), The International Bill of Human Rights, available at <https://www.ohchr.org/Documents/Publications/FactSheet2Rev.1en.pdf>.

[24] UDHR, Article 1.

everyone is entitled to all rights and freedoms 'without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status'.[25] As IHRL has developed, the provisions have been restated and elaborated in treaties and jurisprudence such that states are under an obligation to eliminate direct and indirect discrimination in law, policy and practice and, as a matter of priority, to take special measures to protect persons in vulnerable situations and any individuals and groups who traditionally face barriers to the enjoyment of their human rights.[26] This obligation extends to both formal equality, by treating persons in a similar situation similarly, and substantive equality, by addressing structural and indirect discrimination. It means that equality has to be understood in relation to outcomes as well as opportunities in regard to the enjoyment of the rights enumerated in the UDHR.[27] As such, equal treatment should not be conflated with uniform measures in order to ensure that laws, policies and practices do not perpetuate the disadvantage faced by certain parts of the population.[28]

Big data and AI can increase inequality and discrimination in three ways.[29] First, AI systems may further discrimination and deepen inequality as a result of using data embedded with existing prejudices and stereotypes. Many applications of new technologies are reliant on data, but input data may contain biases due to the nature of available data and the way it is collected and analysed. For example, the results of internet search engines are algorithmic outputs that rely on existing word associations. If racial, gender and other stereotypes are embedded in patterns of language used, this could mean that the algorithm learns and acquires such biases, thus returning skewed results.[30] Further, in designing data-driven algorithmic and automated systems, developers decide on the relevance and significance of certain variables to the particular outcome the

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[25] UDHR, Article 2. International human rights instruments define discrimination as any distinction, exclusion, restriction or preference based on any of the protected characteristics which has the purpose or effect of nullifying or impairing the recognition, enjoyment or exercise, on an equal footing, of human rights and fundamental freedoms in the political, economic, social, cultural or any other field of public life.

[26] International Covenant on Economic, Social and Cultural Rights (New York, 16 Dec. 1966) 993 U.N.T.S. 3, entered into force 3 Jan. 1976.; UN, Committee on Economic, Social and Cultural Rights, *General Comment No. 20 on Non-Discrimination in Economic, Social and Cultural Rights(Article 2)*, UN Doc. E/C.12/GC/20, 2 July 2009; International Covenant on Civil and Political Rights (New York, 16 December 1966) 999 U.N.T.S. 171 and 1057 U.N.T.S. 407, entered into force 23 March 1976; UN, Human Rights Committee, *General Comment 18 on Non-Discrimination*, 10 November 1989; International Convention on the Elimination of All Forms of Racial Discrimination (New York, 7 March 1966) 660 U.N.T.S. 195 (1966), entered into force 4 January 1969; Convention on the Elimination of All Forms of Discrimination against Women (New York, 18 December 1979) 1249 U.N.T.S. 13 (1980), entered into force 3 September 1981; Convention on the Rights of Persons with Disabilities (New York, 13 December 2006) 2515 U.N.T.S. 3 (2006) entered into force 3 May 2008.

[27] UN, Committee on Economic, Social and Cultural Rights, *General Comment 20*, 8, 37, 38.

[28] UN, Human Rights Committee, *General Comment 18*, 10.

[29] See, also, Margaret Mitchell et al. 'Model Cards for Model Reporting' arXiv:1810.03993; Kenneth Holstein et al., 'Improving Fairness in Machine Learning Systems: What Do Industry Practitioners Need?' (Thirty-Second Conference on Neural Information Processing Systems, Montreal, Canada, December 2018); Timnit Gebru and Margaret Mitchell, 'Machine Learning Bias and Fairness' (*Google Cloud Platform Podcast*, 14 February 2018), available at <https://www.gcppodcast.com/post/episode-114-machine-learning-bias-and-fairness-with-timnit-gebru-and-margaret-mitchell/>.

[30] Aylin Caliskan, Joanna J. Bryson, Arvind Narayanan, 'Semantics derived automatically from language corpora contain human-like biases' (14 April 2017) 356 (6334) Science 183-186.

technology is designed to produce. These decisions are individual value judgments that are informed and influenced by a person's lived experience and pre-existing biases. Designers and developers may not consider the risks of discrimination to particular individuals or groups, while the algorithmic process itself may also give rise to discrimination in the aggregate. It is important therefore, for the design of systems to include possibilities to prevent and identify any such discrimination.[31]

Second, the use of big data and AI can widen and deepen the digital divide within and among societies. The development and deployment of AI is led by a small number of states and major technology companies based in places like Silicon Valley in the US.[32] This concentration has the potential to create a gap – an AI divide –between and within societies in terms of those who benefit from these developments and those who are left behind.[33] It may also produce disproportionate benefits and disproportionate harms to certain individuals and groups, depending on how the technology is used. Given that there is already a digital divide from disparity in access to information and communications technology, big data and AI could deepen existing inequality between and within societies.[34]

Third, big data-driven applications have been introduced into decision-making processes in relation to people already marginalised or in positions of vulnerability. For example, on a recent visit to the UK, the UN Special Rapporteur on extreme poverty and human rights, noted that the increasing use of automation within the UK's national social security payment system, called 'Universal Credit', puts the most vulnerable and those with poor digital literacy through a 'nationwide digital experiment'.[35] He also argued that this erects 'digital barriers' for disadvantaged individuals and groups in society who are more likely to access such services.[36]

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[31] World Economic Forum, 'How to Prevent Discriminatory Outcomes in Machine Learning' (White Paper, March 2018), available at <http://www3.weforum.org/docs/WEF_40065_White_Paper_How_to_Prevent_Discriminatory_Outcomes_in_Machine_Learning.pdf>; Michael Kearns, 'Fair Algorithms for Machine Learning' (2017) Proceeding of the 2017 ACM Conference on Economics and Computation 1; John Burn-Murdoch, 'The problem with algorithms: magnifying misbehaviour *The Guardian* (London, 14 August 2013), available at <https://www.theguardian.com/news/datablog/2013/aug/14/problem-with-algorithms-magnifying-misbehaviour>.

[32] There have been various initiatives created in counter response. See, for example, Black in AI, available at <https://blackinai.github.io/>; LatinX in AI Coalition, available at <http://www.latinxinai.org/>; Queer in AI, available at <https://queerai.github.io/QueerInAI/>.

[33] See also Justice, Report on 'Preventing Exclusion from Online Justice' (April 2018), available at <https://justice.org.uk/new-justice-report-on-preventing-digital-exclusion/>.

[34] See, for example, Koumbou Boly Barry, UN Special Rapporteur on the right to education, 'Report on the digital revolution in education', UN Doc. A/HRC/32/37, 6 April 2016; OECD, 'Understanding the Digital Divide' (2001) available at <https://www.oecd.org/sti/1888451.pdf>; UN Human Rights Council, 'Report of the Office of the UN High Commissioner for Human Rights on Promotion, protection and enjoyment of human rights on the Internet: ways to bridge the gender digital divide from a human rights perspective', UN Doc A/HRC/35/9, 5 May 2017.

[35] See also, for example, Philip Alston, UN Special Rapporteur on extreme poverty and human rights, Statement on Visit to the United Kingdom (London, 16 November 2018), available at <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=23881&LangID=E>.

[36] ibid.

All three ways are likely to increase vulnerability, heighten marginalisation and intensify exclusion, as well as presenting risks to the enjoyment of other human rights.[37]

2. The Right to Privacy

The right to privacy, established in article 12 of the UDHR, has received the most attention in discussions on big data and AI.[38] In part, this is because the changes to information architecture very clearly point to risks to privacy. The right to privacy protects individuals against arbitrary or unlawful interference with their privacy, family, home or correspondence, as well as against attacks upon their honour and reputation.[39] New and emerging technologies have enabled data to be gathered from a new range of sources such as integrated applications ('apps') and connected devices. Big data and AI have transformed the type and volume of information that can be collected, consolidated, processed, and shared efficiently within and between different actors such as states and businesses. The shift in developments in data processing and their architectures have created possibilities not only for information to be accessed about individuals, but also for inferences to be made about those individuals. The amalgamation of (previously distinct) fragments of information, including anonymised information, can be used to create detailed insights into individuals, their interests and preferences, lifestyle patterns, and social connections, as well as inferences about private thoughts.

Such 'insights', which may well be inaccurate or incomplete, can shape how decisions are made about people, often without their knowledge or meaningful consent. It is often not possible to know how information might be collected and used by AI systems and what the consequences might be. Examples of how data have already been used in unpredictable ways include the use of telephone metadata (such as the numbers dialled, time, length

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[37] Support for addressing the impact of AI on equality and non-discrimination is increasing. See, for example Amnesty International and Access Now, 'The Toronto Declaration: Protecting the right to equality and non-discrimination in machine learning systems', 16 May 2018, available at <https://www.accessnow.org/cms/assets/uploads/2018/08/The-Toronto-Declaration_ENG_08-2018.pdf>.

[38] See, for example, UN Human Rights Council, 'Report of the Office of the UN High Commissioner for Human Rights on The Right to Privacy in the Digital Age', UN Doc A/HRC/39/39, 3 August 2018.

[39] UDHR, Article 12.

and frequency of calls) to identify a person's private information such as their health data[40] and the use of social media posts to analyse an individual's personality and lifestyle, and by inference, their credit worthiness.[41]

It is also often not possible to anticipate or fully understand how information might be shared with third parties.[42] For example, the allegations that Cambridge Analytica harnessed the data of Facebook users indicate the extent to which data shared with one company could be accessed, harvested, and processed into so-called 'actionable insights' by another company.[43] At first, this incident was mainly reported as a data breach, affecting individuals' right to privacy. However, the issues were not only about obtaining data, but also the ways in which they were used.[44] In this case, data collected and amalgamated were allegedly used to support political campaigning. The capacity of companies to influence political opinion strikes at the heart of a democratic society and brings into play the right to freedom of opinion and expression.

Interferences with privacy can discourage free opinion and expression as '[t]he sense that one is being watched inflicts a chilling effect on a wide range of wholly lawful activity'.[45] For example, smartphone data can be used to create digital profiles of individuals by amalgamating and processing inputs such as internet search history, location data, communication and communications data. These data can be fused with data from other sources such as CCTV and analysed with facial recognition technology. An interference with the right to privacy could therefore have a chilling effect on a person's behaviour. These risks need to be better understood as modifications in behaviour or self-censorship could also adversely affect freedom of opinion and expression.[46]

Other developments in datafication and information networks also demonstrate how interference with the right to privacy can have implications for other rights. For example, information about a person's health can now be gleaned from fitness tracking apps and wearable devices and therefore the right to privacy needs to apply to this

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[40] Jonathan Mayer, Patrick Mutchler, and John C. Mitchell, 'Evaluating the privacy properties of telephone metadata'(2016) 113(20) Proceedings of the National Academy of Sciences 5536.

[41] Bill Hardekopf, 'Your Social Media Score May Soon affect Your Credit Score' (*Forbes*, 23 October 2015), available at <https://www.forbes.com/sites/moneybuilder/2015/10/23/your-social-media-posts-may-soon-affect-your-credit-score-2/#ae97af0e4ed3>.

[42] Narseo Vallina-Rodriguez, Srikanth Sundaresan, '7 in 10 Smartphone Apps Share Your Data with Third-Party Services' (*Scientific American*, 30 May 2017), available at <https://www.scientificamerican.com/article/7-in-10-smartphone-apps-share-your-data-with-third-party-services/>.

[43] The Guardian, 'The Cambridge Analytica Files', available at <https://www.theguardian.com/news/series/cambridge-analytica-files>.

[44] Lorna McGregor, 'Cambridge Analytica is more than a data breach – it's a human rights problem' (*The Conversation*, 4 June 2018), available at <https://theconversation.com/cambridge-analytica-is-more-than-a-data-breach-its-a-human-rights-problem-96601>.

[45] David D. Cole 'After Snowden: Regulating Technology-Aided Surveillance in the Digital Age' (2016) 44 Capital University Law Review 677, 686.

[46] James Vincent. 'Artificial Intelligence is Going to Supercharge Surveillance' (*The Verge*, 23 January 2018) available at: <https://www.theverge.com/2018/1/23/16907238/artificial-intelligence-surveillance-cameras-security>.

data, and connect with implications for the right to health. The same point can be made with regard to facial recognition technology and in-home personal assistants that have access to biometric information, lifestyle patterns and preferences which provide a gateway for data collection at the heart of our personal lives.

While the protection of the right to privacy remains a core and pressing issue in and of itself, as this section demonstrates, privacy is also a gatekeeper to the realisation of other rights.[47]

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[47] HRBDT, Written submission to OHCHR: The Right to Privacy in the Digital Age (2018), available at <https://www.ohchr.org/Documents/Issues/DigitalAge/ReportPrivacyinDigitalAge/HRBDT.pdf>.

B. THE HUMAN RIGHTS' IMPACT OF THE USE OF BIG DATA AND AI IN KEY SECTORS

Looking at big data and AI through the lens of the UDHR not only underscores the gatekeeper role of equality and non-discrimination and privacy but also highlights the impact on human rights brought about by their use in key sectors such as education, work, in social care, health and law enforcement, and on groups in positions of vulnerability such as refugees and the elderly. Such impacts can range from the beneficial to the harmful.

1. The Impact of Big Data and AI on the Right to Education

The UDHR sets out the right to education as both an individual right and an enabling right to the realisation of other human rights.[48] IHRL provides that states have a duty to provide a life-long education which should be available, accessible, acceptable and adaptable for everyone under their jurisdiction, without discrimination.[49] Big data and AI can impact on all these aspects of the right to education and affect its enjoyment throughout the life of an individual.[50] Technology can contribute towards the realisation of child rights in this context.[51]

Big data and AI can enhance the availability and accessibility of education. For example, these technologies have been mooted as a solution for teaching students in areas where there are no schools or they are hard to reach. For instance, UNESCO leads a project that offers an online learning platform in real time to students in remote areas of Mozambique and Zimbabwe in order to enable interaction between students, their peers and teachers.[52] UNESCO, UNHCR and UNICEF are also piloting a series of projects to provide education to child and

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[48] UN, Committee on Economic, Social and Cultural Rights, *General Comment No. 13: The right to education (Article 13),* UN Doc. E/C.12/1999/10, 8 December 1999, 1.

[49] cf Article 26 UDHR, Articles 13 and 14 International Covenant on Economic, Social and Cultural Rights; European Convention for the Protection of Human Rights and Fundamental Freedoms, as amended by Protocols Nos. 11 and 14, 4 November 1950, ETS 5, Article 2, Protocol 1; Organization of American States (OAS), Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights ("Protocol of San Salvador"), 16 November 1999, A-52, Article 13 and Organization of African Unity (OAU), African Charter on Human and Peoples' Rights ("Banjul Charter"), 27 June 1981, CAB/LEG/67/3 rev. 5, 21 I.L.M. 58 (1982), Article 17.

[50] Kishore Singh, UN Special Rapporteur on the Right to Education, Annual Report on 'Right to Education in the Digital Age', UN Doc. A/HRC/32/37, 6 April 2016.

[51] UNICEF, 'Generation AI: Engaging stakeholders to build AI powered solutions that help realize and uphold child rights', available at <https://www.unicef.org/innovation/GenerationAI>.

[52] See the UNESCO ICT transforming education in Africa Project available at <https://en.unesco.org/themes/ict-education/kfit>and the last report available at <http://unesdoc.unesco.org/images/0026/002659/265908E.pdf>. See also <https://www.scmp.com/news/china/society/article/2129821/could-online-classrooms-be-answer-teacher-shortage-rural-china>.

adult refugees around the world through online and offline interactive AI-powered learning platforms.[53] Similarly, massive online open courses organised by universities worldwide and 'chatbots' for learning languages and other skills can enhance lifelong learning and vocational training on top of traditional teaching methods.

AI can also enable educators to take more effective approaches to the particular learning needs of individual students and tailor school curricula to students' needs.[54] Adaptive learning software, powered by AI and machine learning tools, can help tailor education for specific personal needs and make education accessible to everyone, without discrimination based on language, disability or age.[55] Persons with disabilities can access content in other formats facilitated by new technologies. Some applications can convert teaching material to other formats, such as Braille, or audio versions. For example, the Seeing AI app by Microsoft reads out loud any kind of text and describes any kind of picture.[56]

However, all these promising opportunities to enhance the right to education are dependent on the availability of internet access and a device to connect to it, underscoring the continuing challenges with the digital divide. According to the UN Special Rapporteur on the Right to Education, only 34% of households in highly-resourced states and 7% in less-resourced states have access to the internet and devices, and communication infrastructures are often expensive.[57] Therefore, the first challenge is to ensure equal access to the internet to ensure equality and non-discrimination in the access to education facilitated by new technology. To this end, UNICEF Innovation has developed a new tool, Project Connect, to address the digital divide in education.[58] UNICEF is also piloting a study on the effect of digital educational platforms in Namibia to identify the impact

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[53] UNESCO, 'A lifeline to learning. Leveraging technology to support education for refugees' (Paris 2018), available at <http://unesdoc.unesco.org/images/0026/002612/261278e.pdf>. See also, the Global Compact on Refugees, Report of the United Nations High Commissioner for Refugees, Part II Global compact on refugees, A/73/12 (Part II), 13 September 2018.

[54] See, among others, Kevin Nelson, '8 ways machine learning will improve education in the future' (*Big Data made simple,* 19 October 2017), available at <https://bigdata-madesimple.com/8-ways-machine-learning-will-improve-education/> and Ron Drabkin, 'Machine Learning: The "Next Big Thing" in Education (*Getting Smart,* 8 April 2017), available at <https://www.gettingsmart.com/2017/04/next-big-thing-education/>.

[55] See 'Artificial Intelligence in The Classroom' (*Microsoft Education,* 1 March 2018), available at <https://educationblog.microsoft.com/2018/03/artificial-intelligence-in-the-classroom/> and 'Microsoft Translator for Education', available at <https://translator.microsoft.com/help/education/>.

[56] Microsoft, *Seeing AI*, available at <https://www.microsoft.com/en-us/seeing-ai>.

[57] Kishore Singh, UN Special Rapporteur on the Right to Education, Annual Report on 'Right to Education in the Digital Age', UN Doc. A/HRC/32/37, 6 April 2016, 35.

[58] See UNICEF, 'Project Connect, in Partnership with UNICEF's Office of Innovation, Launches First of Its Kind, Interactive Map Visualizing the Digital Divide in Education', 2 November 2017, available at <http://unicefstories.org/2017/11/02/schoolmappingprojectconnect/> and 'Project Connect', available at <https://projectconnectworld.squarespace.com/>.

that content localisation, adaptive learning features and other AI tools in education may have on children and their communities in order to improve its use and avoid negative effects.[59]

Moreover, some of these tools for enhancing education, particularly personalised education tools, are reliant on access to user data. This creates risks to privacy and other human rights as well a situation of rights 'trade-off' whereby some rights may be compromised in order to enable the realisation of others. Given the educational context, this can be particularly sensitive given that learners may be developing thoughts and opinions on particular subjects which they may not later hold as a result of the educational process. Further, while these tools can supplement and enhance access to education for many individuals, thus addressing accessibility and inequality, there is a risk that they become a substitute for traditional forms of learning and human teachers. Indeed, the New York Times reported of a new digital divide emerging whereby 'children of poorer and middle-class parents will be raised by screens, while the children of Silicon Valley's elite will be going back to wooden toys and the luxury of human interaction'.[60]

The use of big data and AI educational tools therefore needs to be closely monitored since it could lead to inequality in the quality of education received by students and potentially adversely affect vulnerable groups, increasing stigma and marginalisation.[61] The UN Special Rapporteur on the Right to Education has noted this risk by underlining that 'all forms of online education… should be a supplement to, and not a replacement for, proven pedagogical practices'.[62]

2. The Impact of Big Data and AI on the Right to Work

The right to work, is the right to freely choose or accept work, including the right to not be deprived of work unfairly, and the right of access to a system of protection guaranteeing each worker access to employment.[63] To

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[59] See UNICEF, 'Improving school participation: Open access to a digital educational platform in Namibia', 9 April 2018, available at <http://unicefstories.org/2018/04/09/dolikeedunamibia/>.

[60] Nellie Bowles, 'The Digital Gap Between Rich and Poor Kids is Not What We Expected; *The New York Times* (New York, 26 October 2018), available at <https://www.nytimes.com/2018/10/26/style/digital-divide-screens-schools.html>.

[61] Kishore Singh, UN Special Rapporteur on the Right to Education, Annual Report on 'Right to Education in the Digital Age', UN Doc. A/HRC/32/37, 6 April 2016, 117-131.

[62] ibid, 58.

[63] UN, Committee on Economic, Social and Cultural Rights. *General Comment No. 18: The Right to work (Article 6)*, UN Doc. E/C.12/GC/18, 6 February 2006, 4 and 6.

exercise the right to work, accessibility is an essential requirement. Accessibility comprises three dimensions: non-discrimination in access to employment,[64] physical accessibility,[65] and the 'right to seek, obtain and impart information on the means of gaining access to employment through the establishment of data networks on the employment market at the local, regional, national and international levels'.[66] New technologies like AI can create or exacerbate inequality in access to the right to work in three ways.

First, the use of big data analytics to power advertisement personalisation creates an inherent tension with the equal access to job opportunities. It has become common practice for job vacancies to be advertised online,[67] and to use machine learning algorithms to deliver those advertisements to selected groups. For example, Facebook allows businesses to target advertisements based on a combination of factors including age, gender and other characteristics.[68] Such tools make it possible to deliver advertisements to what are perceived to be the most relevant audiences, but it may also prevent other candidates who do not fall within those parameters from seeing the advertisement. Such practices can be at odds with the accessibility requirement of the right to work, and can ultimately result in discrimination. For example, studies have shown that online advertisements can discriminate against women. These studies claim that men are shown online advertisements for high-paying jobs,[69] and for career coaching services for executive positions with more than US$200,000,[70] much more frequently than women. Similarly, studies have claimed that companies that use online advertisement services can limit their visibility to selected age groups and exclude older workers from seeing job advertisements. [71]

Second, big data and AI can automate discriminatory hiring practices at scale. Data-driven hiring algorithms can be used to navigate large numbers of job applicants, saving time and increasing efficiency for hiring managers. However, machine learning systems can encode and reflect pre-existing human biases in data. By learning 'what a "good" hire looks like based on…biased data', automated systems evaluate job applicants based on subjective

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[64] ibid, 12(b)(i) and 31(a).
[65] ibid, 12(b)(ii).
[66] ibid, 12(b)(iii).
[67] Hannah Morgan, 'How Companies Recruit in 2018' (*US News*, 13 November 2018) available at <https://money.usnews.com/money/blogs/outside-voices-careers/articles/how-companies-recruit-in-2018>.
[68] Facebook, 'Ad Targeting', available at <https://www.facebook.com/business/help/717368264947302>.
[69] American Civil Liberties Union, 'Facebook Equal Employment Opportunity Commission Complaint', 18 September 2018 available at <https://www.aclu.org/legal-document/facebook-eeoc-complaint-charge-discrimination/>.
[70] Amit Datta et al., 'Automated Experiments on Ad Privacy Settings' (2015) 1 Proceedings on Privacy Enhancing Technologies 92, 92– 112.
[71] Julia Angwin et al., 'Dozens of Companies Are Using Facebook to Exclude Older Workers From Job Ads' (*ProPublica*, 20 December 2017) available at <https://www.propublica.org/article/facebook-ads-age-discrimination-targeting>.

criteria.[72] For example, Amazon's recruiting engine that used machine learning to review applications has been reportedly discriminatory against women.[73] To optimise the company's hiring process, the company trained machine learning systems on previous applications. Due to the high proportion of male candidates in the technology industry reflected in the historical data, the system learned a preference for male candidates over resumes that included the word 'women' or education at women's colleges.[74]

Third, access to the labour market in the digital age poses new challenges.[75] While AI may create jobs, such as analysing big data, information mining, and managing data sharing networks, digital literacy and access to high-speed Internet are required to secure such positions.[76] This could adversely affect disadvantaged and marginalised individuals and groups, who already experience higher levels of unemployment.[77] Moreover, automation offers cost-efficiency benefits by reducing labour hours particularly for low-skilled, highly routine tasks. While job loss is predicted to range from 9 – 47%,[78] this also disproportionately affects occupations involving low-skilled work.[79] Furthermore, it is still unclear what types of jobs the AI age will demand and create.

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[72] Gideon Mann and Cathy O'Neil, 'Hiring Algorithms Are Not Neutral' (*Harvard Business Review,* 9 December 2016), available at <https://hbr.org/2016/12/hiring-algorithms-are-not-neutral>.

[73] Jeffrey Dastin, 'Amazon scraps secret AI recruiting tool that showed bias against women' (*Reuters*,10 October 2018), available at <https://www.reuters.com/article/us-amazon-com-jobs-automation-insight/amazon-scraps-secret-ai-recruiting-tool-that-showed-bias-against-women-idUSKCN1MK08G>.

[74] ibid.

[75] Osoba A. Osonde and William Welser, 'The Risks of Artificial Intelligence to Security and the Future of Work' (*RAND Corporation*, 2017) available at <https://www.rand.org/pubs/perspectives/PE237.html>.

[76] Laura Robinson et al. 'Digital Inequalities and Why They Matter' (2015) 18(5) Information, Communication & Society 569.

[77] Darrell M. West, 'What happens if robots take the jobs? The impact of emerging technologies on employment and public policy' (*Brookings Center for Technology Innovation*, October 2015), available at <https://www.brookings.edu/wp-content/uploads/2016/06/robotwork.pdf>.

[78] Osoba A. Osonde and William Welser 'The Risks of Artificial Intelligence to Security and the Future of Work' (*RAND Corporation,* 2017) available at: <https://www.rand.org/pubs/perspectives/PE237.html>. See also, Leo Kelion, 'AI 'poses less risk to jobs than feared' says OECD' *BBC* (London, 2 April 2018) available at: <http://www.bbc.co.uk/news/technology-43618620>.

[79] David Rotman, 'How Technology is Destroying Jobs' (*MIT Technology Review*, 12 June 2013), available at <https://www.technologyreview.com/s/515926/how-technology-is-destroying-jobs/>; McKinsey Global Institute, 'Jobs Lost, Jobs Gained, Workforce Transitions in a Time of Automation', December 2017, available at <https://www.mckinsey.com/~/media/mckinsey/featured%20insights/future%20of%20organizations/what%20the%20future%20of%20work%20will%20mean%20for%20jobs%20skills%20and%20wages/mgi-jobs-lost-jobs-gained-report-december-6-2017.ashx>.

3. The Effects of Big Data and AI in Later Life

Big data and AI may play a significant role in the lives of older persons. This may be through the use of algorithms to support decisions on who receives social care and at what level.[80] It may also be in the use of assistive technologies and robotics to deliver care or companionship.

The UN Independent Expert on the enjoyment of all human rights by older persons has recognised the potential for using big data and AI to enhance the autonomy, independence and dignity of older persons, enabling them to continue to live in their own homes and communities rather than being placed in care homes.[81] For instance, Intelligent Personal Assistants, such as Amazon Echo or Google Home, can help older people in their everyday life by allowing them to activate other devices in the home via voice commands.[82] However, the technologies themselves imply risks to human rights. Privacy is often cited as a central concern, particularly as it may mean 24-hour 'surveillance' through AI support tools. The smarter forms of these technologies may also present risks to freedom of opinion and expression as previously discussed in this report with the risk of manipulating the thoughts and opinions of users. The security of these devices raises the potential for hacking and harm to older persons, both physically and psychologically through the device or by providing ways in which to identify when a person is at home alone for the purpose of burglary and other crimes. Other studies have noted the potential for older persons to feel infantilised by the use of such technologies.[83]

A central concern about the use of assistive and companion technologies and robotics is their potential to deepen social isolation rather than enable participation and effective inclusion within society.[84] While the introduction of assistive technologies may enhance the dignity of older persons, particularly if related to

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[80] cf *supra*, section A(1) on the right to equality and prohibition of discrimination. Social care is not only relevant to the elderly but also to many other individuals and group that may be temporary or permanently in need of care and assistance. See, for instance, Philip Alston, UN Special Rapporteur on extreme poverty and human rights, Annual Report on Extreme poverty and human rights, UN Doc. A/72/502, 4 October 2017; Philip Alston, UN Special Rapporteur on extreme poverty and human rights, Report on his mission to the United States of America, UN Doc A/HRC/38/33/Add.1, 4 May 2018, section II, para 11; Philip Alston, UN Special Rapporteur on extreme poverty and human rights, Statement on Visit to the USA, (Washington, 15 December 2017), section VI, para 4, available at <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=22533>.

[81] Rosa Kornfeld-Matte, UN Independent Expert on the enjoyment of all human rights by older persons, Annual Report 2017, UN Doc. A/HRC/36/48, 21 July 2017.

[82] See the Intelligent Personal Assistant Project run by the Innovate Trust- Wales. Information available at <https://www.innovate-trust.org.uk/intelligent-personal-assistant-project/department>.

[83] Claudine McCreadie and Anthea Tinker, 'The acceptability of assistive technology to older people' (2005) 25 (1) Ageing & Society 91, 91-110; William A. Banks, 'Artificial Emotions: Robots Caring for the Elderly' (2013) 14 JAMDA , 635-636.

[84] Amanda Sharkey and Noel Sharkey, 'Granny and the robots: ethical issues in robot care for the elderly' (2012) 14(1) Ethics and Information Technology 27.

personal care, it may also reduce or replace the number of human interactions within a day.[85] The automation at supermarket checkouts has been reported to increase the sense of isolation and loneliness of persons for whom these small daily interactions were often the only or main means of human contact.[86] Replacing human assistance may lead to the same issues. These effects could be felt on a larger scale with the introduction of companionship robots. Therefore, the question is whether assistive and companion robotics are foreseen as an addition or replacement to human interaction.[87] The human rights consequences that will flow from that will vary significantly.

4. The Impact of Big Data and AI on the Right to Health

The right to the highest attainable standard of health 'conducive to living a life in dignity' is 'indispensable for the exercise of other human rights'.[88] The right to health contains four interrelated and essential elements: (1) availability of functioning public health and health-care facilities, goods and services, as well as programmes in sufficient quantity; (2) accessibility of health facilities, goods and services (including information) without discrimination; (3) acceptability, i.e. respectful of medical ethics and culturally appropriate; and (4) health facilities, goods and services must be scientifically and medically appropriate and of good quality.[89]

Big data and AI are changing in ways that will impact each of the four essential elements for the right to health.[90] A critical factor is the increased generation of data that can be used in the health context. Such data are not limited to electronic health records, or civil registration and vital statistics. New sources of data come from people's use of wearable technology, including fitness trackers, which can track and monitor personal health

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[85] Arlene Astell, 'Technology and personhood in dementia care' (2006) 7(1) Quality in Ageing and Older Adults 15,15-25; Alistair Roelf Niemeijer, *Surveilling Autonomy, Securing Care: Exploring Good Care with Surveillance Technology in Residential Care for Vulnerable People* (Amsterdam, VU University Press 2015).

[86] See, for example, Chris Allen, 'How the digitalisation of everything is making us more lonely' (*The Conversation*, 7 February 2018), available at < https://theconversation.com/how-the-digitalisation-of-everything-is-making-us-more-lonely-90870>.

[87] Rosa Kornfeld-Matte , UN Independent Expert on the enjoyment of all human rights by older persons, Annual Report 2017, UN Doc. A/HRC/36/48, 21 July 2017, 87-102; Tom Sorell and Heather Draper, 'Robot carers, ethics, and older people' (2014) 16(3) Ethics and Information Technology 183, 183-195.

[88] UN, Committee on Economic, Social and Cultural Rights, *General Comment No. 14 on The Right to the Highest Attainable Standard of Health*, UN Doc. E/C.12/2000/4, 11 August 2000, 1.

[89] ibid, 12.

[90] Carmel Williams, 'Big Data and the Right to Health: Explaining Ourselves!' (HRBDT, 23 November 2016) available at <https://hrbdt.ac.uk/big-data-and-the-right-to-health-explaining-ourselves/>.

information,[91] and also from genome data, much of which is sold from companies that provide genetic testing for tracing ancestry.[92] AI, powered by big data, is being used to assist diagnosis, prognosis, clinical treatment, and overall management of health conditions. Between the individual use of health and fitness related apps, and the sophisticated clinical advances resulting from big data applications and AI, there is the promise of improved health outcomes. In some settings, the use of big data and AI could improve availability, accessibility, acceptability and quality of health facilities, goods and services.[93]

However, technological advances in health also pose significant risks. The increasing integration of health technology and data has resulted in protection gaps. First, health data are no longer restricted by doctor-patient confidentiality. Companies which develop, operate and sell health apps and wearable devices have access to sensitive individual health data, which can be used for commercial purposes without the consent of a user.[94] Second, the integration of AI in healthcare can lead to large scale breaches of data protection if health data are shared improperly.[95] For example, the UK Information Commissioner's investigation into the Royal Free NHS Foundation Trust and Google DeepMind partnership concluded that the processing of patients' personal data did not fully comply with the UK Data Protection Act 1998.[96] Third, health facilities and services reliant on computers and smart and connected systems can be compromised and may be vulnerable to cyber-attacks. As the former Director-General of the World Health Organisation cautioned, 'the potential of AI in health care is huge, but so is the need to take some precautions'.[97] In our view, this includes a range of safeguards that require concrete action to prevent adverse effects on the right to health.

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[91] John Scott-Railton and Andrew Hilts, 'Fit Leaking' (*The Citizen Lab*, 29 January 2018), available at <https://citizenlab.ca/2018/01/fit-leaking-citizen-lab-research-fitness-tracker-privacy/>.

[92] Eric Rosenbaum, '5 biggest risks of sharing your DNA with consumer genetic-testing companies' (*CNBC*, 16 June 2018), available at <https://www.cnbc.com/2018/06/16/5-biggest-risks-of-sharing-dna-with-consumer-genetic-testing-companies.html>.

[93] This might have a particular benefit for marginalised groups or stigmatised healthcare, e.g. abortion provision. See, on that Garnet Henderson, 'Telemedicine could help fill the gaps in America's abortion care' (*Wired,* 8 July 2018), available at <https://www.wired.com/story/telemedicine-could-help-fill-the-gaps-in-americas-abortion-care/>.

[94] Rachel Metz, 'Strava's privacy PR nightmare shows why you can't trust social fitness apps to protect your data' (*MIT Technology Review*, 29 January 2018) available at <https://www.technologyreview.com/s/610090/stravas-privacy-pr-nightmare-shows-why-you-cant-trust-social-fitness-apps-to-protect-your/>; Rob Price, 'Almost every fitness tracker on the market leaves their users at risk of 'long-term tracking of their location' (*Business Insider*, 8 February 2016) available at <https://www.businessinsider.com.au/major-privacy-issues-in-almost-every-fitness-tracker-report-2016-2>.

[95] Amy Dickens and Linsey McGoey, 'Beydon privacy: the right to health implications of data sharing partnerships in healthcare' (HRBDT, 17 May 2018), available at <https://hrbdt.ac.uk/beyond-privacy-the-right-to-health-implications-of-data-sharing-partnerships-in-healthcare/>.

[96] UK Information Commissioner's Office, RFA0627721 – provision of patient data to DeepMind, 3 July 2017, available at <https://ico.org.uk/media/2014353/undertaking-cover-letter-revised-04072017-to-first-person.pdf>.

[97] Dr Margaret Chan, Opening Remarks at the Artificial Intelligence for Good Global Summit, 7 June 2017, available at <https://www.who.int/dg/speeches/2017/artificial-intelligence-summit/en/>.

In addition to these security and privacy issues, there are also risks relating to the ownership and subsequent use of people's data – that is, issues that will affect availability and accessibility of the benefits arising from the technological advances. Big data and AI in the health sector are predominantly owned by the private sector. There is therefore increasing dependence on the private sector for the fundamentals of health care – diagnosis and treatment of health conditions.[98] This raises questions about the affordability of health care, and whether the advances made in health will be equally available to everyone, or if they will be limited to wealthy people in high income countries, or people with health insurance.[99]

5. The Effects of Big Data and AI in the Law Enforcement Context

Big data and AI have been employed widely in the law enforcement context. The most prominent example that has received media attention is predictive policing. Predictive policing involves the use of statistical predictions to direct police resources.[100] For example, PredPol, the market leader in predictive policing, uses data analytics to identify potential crime hotspots, which supports decision-making about police patrols.[101] This software is used, for example, in Kent in the UK, and in Chicago and Los Angeles in the US.[102] The use of data-driven automated risk assessment tools to predict crime hotspots may help to target police resources and possibly contribute to greater efficiency. However, such assessments could lead to over-policing of already heavily policed areas, and result in disproportionate stop and search practices based on race or ethnicity.[103] Such systems rely on historical crime data as inputs for its predictive analysis, however historical crime data may not

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[98] Carmel Williams, 'ALMA-ATA at 40: Its Values are Relevant to the Data Economy' (2018) Health and Human Rights Journal, 18 September 2018, available at <https://www.hhrjournal.org/2018/09/alma-ata-at-40-its-values-are-relevant-to-the-data-economy/>.

[99] Carmel Williams, 'Right to health impact assessments before using Big Data' (HRBDT, 6 August 2018), available at <https://hrbdt.ac.uk/right-to-health-impact-assessments-needed-before-using-big-data/>; Carmel Williams and Paul Hunt, 'Neglecting human rights: accountability, data and Sustainable Development Goal 3' (2017) 21(8) The International Journal of Human Rights 1114.

[100] Walter Perry et al., 'Predictive Policing: The Role of Crime Forecasting in Law Enforcement Operations' (RAND Corporation, 2013).

[101] PredPol, Overview, available at <http://www.predpol.com/about/>.

[102] PredPol, Kent Police Use PredPol to Prevent Violent Crime, 7 August 2013, available at <http://www.predpol.com/kent-police-use-predpol-to-prevent-violent-crime/>; PredPol, LAPD Archives, available at <http://www.predpol.com/category/lapd/>; Timothy McLaughlin, 'As shootings soar, Chicago police use technology to predict crime' (Reuters, 5 August 2017), available at <https://www.reuters.com/article/us-chicago-police-technology/as-shootings-soar-chicago-police-use-technology-to-predict-crime-idUSKBN1AL08P>.

[103] American Civil Liberties Union, 'Predictive Policing Today: A Shared Statement of Civil Rights Concerns', 31 August 2016, available at <https://www.aclu.org/other/statement-concern-about-predictive-policing-aclu-and-16-civil-rights-privacy-racial-justice>; William Isaac and Andi Dixon, 'Why big-data analysis of police activity is inherently biased' (The Conversation, 10 May 2017), available at <https://theconversation.com/why-big-data-analysis-of-police-activity-is-inherently-biased-72640>; HRBDT, Written evidence to the UK Home Affairs Committee Inquiry on Policing for the Future, available at <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/home-affairs-committee/policing-for-the-future-changing-demands-and-new-challenges/written/47227.html>.

reflect the true incidence of crime and could be influenced by reported crime and biases in policing. Using such data to generate predictions may simply reinforce existing discrimination and reproduce the same effects.

Algorithms have also been used to support risk assessments in bail and sentencing decisions.[104] Some courts are using algorithmic risk tools developed by private companies that calculate a risk score for individuals based on a list of factors, to inform their bail and sentencing decisions.[105] Investigative journalists have found that such use of such tools may result in discrimination against certain groups.[106] While often argued to increase the objectivity of decisions, the use of algorithmic risk-assessments can introduce serious questions about the robustness of judicial discretion and quality of decisions when such risk assessment scores are part of the judge's deliberations. Algorithmically calculated risk scores may take account of variables that do not reflect the threat of recidivism, and instead correlate with grounds that have no relevance or are legally impermissible to consider for such decisions. For example, these may include taking into account the location of a person's home, their social connections, and their prior interactions (not convictions) with law enforcement. These factors could proxy for race and socioeconomic status, and impact particular individuals and communities more so than others.

Most recently, the use of automated and live facial recognition by law enforcement has attracted criticism and raised questions regarding the lawfulness of such tools.[107] Live facial recognition is the real-time use of facial recognition technology to match facial images against existing databases or 'watchlists' to identify people. For example, various police forces in the UK have been given operational powers to use facial recognition systems and have been 'trialling' such technology.[108] These technologies link databases with live cameras to identify known suspects, and have been used in mass events.[109] The accuracy of such tools has been questioned[110] and serious and potentially disproportionate risks to the rights to privacy, expression, association, and peaceful

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[104] See Laurel Eckhouse et al., 'Layers of Bias: A Unified Approach for Understanding Problems with Risk Assessment' (2018) 20(10) Criminal Justice and Behavior 1.

[105] Northpointe, COMPAS Core, available at <http://www.northpointeinc.com/files/downloads/Risk-Needs-Assessment.pdf>.

[106] Julia Angwin et al., 'Machine Bias', (*Propublica,* 23 May 2016), available at <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing>.

[107] Gaetan Portal, 'Police facial recognition system faces legal challenge' (*BBC,* 25 July 2018), available at <https://www.bbc.com/news/uk-44928792>; Big Brother Watch, 'Face Off: The lawless growth of facial recognition in UK policing', May 2018, available at <https://bigbrotherwatch.org.uk/wp-content/uploads/2018/05/Face-Off-final-digital-1.pdf>.

[108] The Metropolitan Police, 'Live Facial Recognition trial', available at <https://www.met.police.uk/live-facial-recognition-trial/>.

[109] ibid; South Wales Police, Facial Recognition, available at <https://www.south-wales.police.uk/en/advice/facial-recognition-technology/>.

[110]Chris Foxx, 'Face recognition police tools 'staggeringly inaccurate'' (*BBC,* 15 May 2018), available at <https://www.bbc.com/news/technology-44089161>. Steve Lohr, 'Facial Recognition Is Accurate, if You're a White Guy' (New York Times 9 February 2018) available at <https://www.nytimes.com/2018/02/09/technology/facial-recognition-race-artificial-intelligence.html>.

assembly have not been fully taken into account. For example, a mental health watch list has been used as one of the databases for identification.[111] In the UK, proposals have been made to create a new police super database, which is planned to integrate the Police National Computer and Police National Database in one place.[112] Operationally, this would greatly expand the volume of data being processed, and would magnify the risks of applying tools such as predictive policing and live facial recognition on such data.[113]

The use of big data and AI in the law enforcement context poses similar risks as in other applications regarding the dangers of biased data and the problems with utilising profiling tools. The risks are, however, heightened here because of the potential serious consequences for individuals and groups.

6. The Impact of Big Data and AI on Refugees and Asylum-Seekers

Big data and AI have the potential to improve the planning and delivery of services to more effectively meet the ongoing needs of displaced populations, including access to health services and food.[114] They have enabled more accurate predictions of displacement, and new technologies may further assist in approaches to humanitarian needs.[115] For example, the UN High Commissioner for Refugees (UNHCR) uses digital fingerprinting and Global Positioning System (GPS) in its humanitarian delivery in South Sudan.[116] Strengthened development and adoption of big data innovations can thus contribute to responses to potential global and local crises. However,

[111]Big Brother Watch, 'Face Off: The lawless growth of facial recognition in UK policing', May 2018, available at <https://bigbrotherwatch.org.uk/wp-content/uploads/2018/05/Face-Off-final-digital-1.pdf>.

[112] UK Home Office, National Law Enforcement Data Programme, Law Enforcement Data Service (LEDS) – Privacy Impact Assessment Report, July 2018, available at <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/721542/NLEDP_Privacy_Impact_Assessment_Report.pdf>.

[113]Liberty, Police Databases, available at <https://www.libertyhumanrights.org.uk/human-rights/privacy/police-databases>; Hannah Couchman, 'Why We're No Longer Taking Part in a Consultation on the Police's New Super-Database' (Liberty, 1 October 2018), available at <https://www.libertyhumanrights.org.uk/news/blog/why-we%E2%80%99re-no-longer-taking-part-consultation-police%E2%80%99s-new-super-database>.

[114] Vivian Ng and Catherine Kent, 'Human Rights in the Digital Age: The Promises of Big Data and Technology (Part I)' (HRBDT, 16 November 2016), available at <https://hrbdt.ac.uk/human-rights-in-the-digital-age-the-promises-of-big-data-and-technology-part-i/>. See Global Compact on Refugees, Report of the United Nations High Commissioner for Refugees, Part II Global compact on refugees, A/73/12 (Part II), 13 September 2018 and more generally, Geoff Gilbert and Anna Magdalena Rüsch, 'Rule of Law and UN Interoperability', 30 *IJRL* 31-79 (2018).

[115] Chris Earney, 'Human Rights in a Digital Age', HRBDT Conference, 24 May 2018, available at <https://1ing2s14id7e20wtc8xsceyr-wpengine.netdna-ssl.com/wp-content/uploads/2015/12/HRBDT-Full-Conference-Report-Final-19-Sept-2018.pdf>. For information on how UNHCR protects the privacy rights of those on whom it holds such data, see UNHCR, 'Policy on the Protection of the Personal Data of Persons of Concern to UNHCR', 15 May 2015, available at <http://www.refworld.org/docid/55643c1d4.html>"

[116] Melita H. Sunjic and Kathryn Mahoney, 'Modern technology helps meet the needs of refugees in South Sudan' (UNHCR, 27 December 2012), available at <https://www.unhcr.org/news/makingdifference/2012/12/50dc5a309/modern-technology-helps-meet-needs-refugees-south-sudan.html>. See also, more generally, UNHCR, Demographic Projection Tool, available at <http://demographicprojection.unhcr.org/#_ga=2.152538553.166216106.1543296217-134861216.1543296217>.

the uses of technology even for positive purposes are not by inherently risk-free. Therefore, the use of new technology in this area should be subject to the same scrutiny for human rights compliance as in other sectors, and concerns around the use of biometrics are notable in this regard.

Indeed, technology can present a range of digital and physical risks for populations in and escaping armed conflict. For example, the large amounts of data, including biometric data, humanitarian agencies collect on refugees and other displaced persons through registration procedures, creates an inherent risk to privacy and data protection for a group of people in vulnerable positions.[117] The core humanitarian principles of humanity, neutrality, impartiality and independence, should therefore be at the heart of guidance about thinking about the way in which new technologies can be integrated into humanitarian responses.[118]

Some states have started to use automated decision-making and AI for processing applications in their immigration and refugee systems.[119] The use of such technology can be beneficial for improving the efficiency of procedures involved in evaluating applications and immigration decisions. However, the significance of such decisions by immigration officials on individuals' lives makes it critical to consider the risks involved in such uses. Algorithmic discrimination has the potential to create an extreme system of vetting,[120] and also threatens the rights to freedom of movement, association, life, liberty and security.

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[117] See Brussels Privacy Hub and International Committee of the Red Cross, Handbook on Data Protection in Humanitarian Action, 23 August 2017, available at <https://www.icrc.org/en/publication/handbook-data-protection-humanitarian-action>. And see Global Compact on Refugees, Report of the United Nations High Commissioner for Refugees, Part II Global compact on refugees, A/73/12 (Part II), 13 September 2018; Amnesty International, 'Public Statement on the Global Compact on Refugees' (April 2018), available at <https://www.unhcr.org/events/conferences/5ad9f3cb7/amnesty-international-public-statement-global-compact-refugees.html>.

[118] See UN General Assembly, 'Strengthening of the coordination of humanitarian emergency assistance of the United Nations' UN Doc. A/RES/46/182, 19 December 1991 and all subsequent General Assembly resolutions on the subject, including resolution A/RES/71/127; see also, UNHCR, 'Policy on the Protection of the Personal Data of Persons of Concern to UNHCR', 15 May 2015, available at <http://www.refworld.org/docid/55643c1d4.html>.

[119] Petra Molnar and Lex Gill, 'Bots at the Gate: A Human Rights Analysis of Automated Decision-Making in Canada's Immigration and Refugee System', University of Toronto International Human Rights Program and The Citizen Lab, 26 September 2018, available at <https://citizenlab.ca/wp-content/uploads/2018/09/IHRP-Automated-Systems-Report-Web-V2.pdf>; 'Canadian Authorities to Track Unverified Refugees with Voice Recognition' (FindBiometrics, 26 July 2018), available at <https://findbiometrics.com/canadian-authorities-refugees-voice-recognition-507261/>; 'Germany to use voice recognition to identify migrant origins' (BBC, 17 March 2017), available at <https://www.bbc.com/news/world-europe-39307155>; Gianluca Mexxofiore, 'Why using voice recognition to identify refugees is controversial (Mashable, 20 March 2017), available at <https://mashable.com/2017/03/20/germany-voice-recognition-software-refugees-/?europe=true#RRCop0O74qq8>.

[120] See Brennan Center for Justice, ICE Extreme Vetting Initiative: A Resource Page, 24 May 2018, available at <https://www.brennancenter.org/analysis/ice-extreme-vetting-initiative-resource-page>

C. Striking at the Core of Identity

By looking at the particular effects of big data and AI on education, work, in later life, health, law enforcement, and on those in vulnerable positions such as refugees and asylum-seekers, this report has so far provided a cross-section of the potential impacts of big data and AI on the enjoyment of a range of rights and aspects of life. In addition to these impacts, the use of big data and AI can have significant effects on the development of our identity, personal autonomy and agency.

Big data and AI can interfere with a range of rights that individually and collectively constrain individual autonomy and self-identification. As the opening lines of the UDHR declare, 'the foundation of freedom, justice and peace in the world' is the 'recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family.[121] Yet, the restrictions on rights by the use of big data and AI, can effectively undermine human dignity and the inalienability of fundamental rights and freedoms.

There are three main ways in which the impacts of big data and AI may undermine the power of individuals to make free choices. First, the use of big data and AI to deliver personalised content can restrict individuals' access to diverse information.[122] Digitalisation and vast developments in the information environment have opened up many possibilities for 'broader and quicker sharing of information and ideas globally'.[123] Social media platforms, for example, have been labelled the 'modern public square'.[124] These platforms are a 'gateway for information and an intermediary for expression'.[125] As much as they facilitate and enable enjoyment of the right to freedom of opinion and expression, big data and AI-driven tools can also restrict and limit those rights. The use of AI to curate search results and newsfeeds and tailor advertisement placements provides hosting companies with the ability to moderate content. It also allows individuals and organisations to deliver content in targeted advertising campaigns on such platforms much more efficiently. This has changed the delivery of news, and the functions of the broadcast and publishing industry. Prior to the age of social media and instant newsfeeds, major news

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[121] UDHR, preambular para 1.
[122] See, for example, UN Human Rights Council, 'Report of the Special Rapporteur on the Promotion and Protection of the Right to Freedom of Opinion and Expression on A Human Rights Approach to Platform Content Regulation', UN Doc A/HRC/38/35, 6 April 2018.
[123] David Kaye, UN Special Rapporteur on the promotion and protection of the right to freedom of expression, Report to the General Assembly, UN Doc. A/73/348, 29 August 2018, 1.
[124] *Packingham v. North Carolina*, 582 U.S. (2017), 8.
[125] David Kaye, UN Special Rapporteur on the promotion and protection of the right to freedom of expression, Report to the Human Rights Council, UN Doc. A/HRC/32/38, 11 May 2016, 2.

agencies with specific editorial lines provided a selection of sources through which people could obtain information. While people could select a preferred newspaper or channel, they could still access and receive information from alternative sources if they chose to do so. What is different now is the fact that content deemed irrelevant for individuals by algorithmic content filters on platforms for example is not included in the online newsfeed specific to that individual. This selective funnelling of information has been criticised for creating 'filter bubbles' and echo chambers, whereby individuals are exposed to what is deemed the most relevant content on the basis of their historical browsing activity and known or inferred interests, preferences and social connections.[126] This personalisation is beneficial for improving the relevance of content but, at the same time, narrows the range and diversity of information and ideas that individuals receive,[127] which is critical for the development of opinion and thought.

Second, social media platforms have created new forums for communication as well as new possibilities for tracking digital trails and activity online. This carries a risk to many rights and to democratic participation. As the allegations about how Cambridge Analytica and Facebook used data demonstrate, the capacity to use big data analytics and AI to influence opinions could have real-world implications that affect individuals as well as society more broadly.

Freedom of expression is interrelated with the enjoyment of other rights central to the democratic process,[128] such as the right to freedom of peaceful assembly[129] and association, [130] and the right to partake in public affairs.[131] Individuals and groups engage, organise and mobilise in dramatically different ways in the digital age than in earlier times. Platforms have created new channels and safe spaces for groups to communicate, and

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[126] Eli Pariser, 'Beware online 'filter bubbles' (TED Talk, March 2011) available at <https://www.ted.com/talks/eli_pariser_beware_online_filter_bubbles?language=en>; Jon Keegan, 'Blue Feed, Red Feed', *The Wall Street Journal* (New York, 18 May 2016), available at <http://graphics.wsj.com/blue-feed-red-feed/>.

[127] UN, Human Rights Committee, *General Comment 34 on Article 19: Freedom of opinion and expression*, UN Doc. CCPR/C/GC/34, 12 September 2011, 14.

[128] UN General Assembly, 'Report of the Special Rapporteur on the Rights to Freedom of Peaceful Assembly and Association', UN Doc A/68/299, 7 August 2013, 5.

[129] 'Assembly' is defined as 'an intentional and temporary gathering in a private or public space for a specific purpose', which includes demonstrations, meetings, strikes, processions rallies and sit-ins: Human Rights Council. 'Report of the Special Rapporteur on the Rights to Freedom of Peaceful Assembly and of Association, Maina Kiai', UN Doc A/HRC/20/27, 21 May 2012, 24.

[130] 'Association' is defined as 'any groups of individuals or any legal entities brought together in order to collectively act, express, promote, pursue or defend a field of common interests', which includes civil society organisations, cooperative, religious associations, political parties and online associations: Human Rights Council. 'Report of the Special Rapporteur on the Rights to Freedom of Peaceful Assembly and of Association, Maina Kiai', UN Doc A/HRC/20/27, 21 May 2012, 51 - 52.

[131] UN, Human Rights Committee. *General Comment No. 34: Article 19: Freedoms of Opinion and Expression* , UN Doc CCPR/C/GC/34, 12 September 2011, 4; UN, Human Rights Committee. *'Annex V: General Comment No. 25'*, UN Doc CCPR/C/21/Rev.1/Add.7, 27 August 1996, 8, 12.

facilitate collective action more efficiently.[132] However, they can also be used by repressive states to identify and target particular individuals on the basis of their known or inferred associations.[133] This is possible not only through traditional means of surveillance and hacking but also by combining different data points such as CCTV, cell phone data, and Twitter data, and linked with AI systems such as live and automated facial recognition technology. For example, police forces have used international mobile subscriber identity (IMSI) catchers to locate and track all mobile phones switched on in a particular area, which can be an effective tool to identify and surveil all the individuals who participate in a particular event such as a protest.[134] Interferences with the right to privacy online can thus restrict the right to freedom of peaceful assembly and association. The use of big data and AI by states in such repressive ways can also create a chilling effect, which could lead to individuals self-censoring and modifying their behaviour and participation in certain activities. This is likely to have a disproportionate impact on people who are already discriminated against.

Third, the advancement of machine-learning that focuses on innovating without limits can be directly in conflict with prohibitions contained in human rights law. A widely reported study from Stanford University claimed that deep neural networks are more accurate than humans at detecting sexual orientation from facial images. There has been a range of criticisms about the validity and accuracy of the study and its methodology.[135] Regardless of how accurate these tools are, the development of such techniques puts individuals at risk because of their perceived sexual orientation. On the basis of a machine's assessment, accurate or not, individuals can be labelled, and discriminated against, and be at risk of violence, or arrest by repressive states. Furthermore, it also threatens the individual right to self-identification regarding sexual orientation.[136] The premise of the study that it is possible to detect one's sexual orientation goes against the core of individual autonomy and identity.

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[132] See, for example, David Kaye, UN Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, 'Report on Encryption and Anonymity', UN Doc.A/HRC/29/32, 22 May 2015; David Kaye, UN Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, 'Follow up Report on Encryption and Anonymity', June 2018, Research Paper 1/2018, available at <https://www.ohchr.org/Documents/Issues/Opinion/EncryptionAnonymityFollowUpReport.pdf>.

[133] Maina Kiai, UN Special Rapporteur on the Rights to Freedom of Peaceful Assembly and of Association, 'Report to the General Assembly', UN Doc A/72/135, 14 July 2017, 48.

[134] See, for example, Privacy International, 'IMSI Catchers', available at <https://privacyinternational.org/explainer/2222/imsi-catchers>.

[135] Drew Anderson, 'GLAAD and HRC call on Stanford University & responsible media to debunk dangerous & flawed report claiming to identify LGBTQ people through facial recognition technology' (GLAAD, 8 September 2017) available at <https://www.glaad.org/blog/glaad-and-hrc-call-stanford-university-responsible-media-debunk-dangerous-flawed-report>; Advances in AI are used to spot signs of sexuality (*The Economist*, 9 September 2017), available at <https://www.economist.com/science-and-technology/2017/09/09/advances-in-ai-are-used-to-spot-signs-of-sexuality>; Blaise Agüera et al., 'Do algorithms reveal sexual orientation or just expose our stereotypes?' (*Medium*, 11 January 2018), available at <https://medium.com/@blaisea/do-algorithms-reveal-sexual-orientation-or-just-expose-our-stereotypes-d998fafdf477>.

[136] ibid. See also 'That AI study which claims to guess whether you're gay or straight is flawed and dangerous' (*Mashable,* 11 September 2017), available at <https://mashable.com/2017/09/11/artificial-intelligence-ai-lgbtq-gay-straight/?europe=true#VNovhvZiwOq4>.

The respect of individual autonomy, at a minimum, requires 'ensuring that users have knowledge, choice and control'.[137] The widespread use of big data and AI tools, that are often developed and supplied by companies to other entities, including states, increases the ability that states and private companies have to control and influence individuals' lives in a range of ways, as well as the organisation and functions of society. This reflects a changing power dynamic that allows states and companies, duty-bearers of human rights, to harness the potential of technology at the cost of harming individuals and their rights in extensive ways, contrary to the minimum standards that human rights require.

Part I of this report has looked at the impact of big data and AI on human rights using a series of different lenses to provide a fuller appreciation of the diverse implications on rights, individually for each specific right and through interconnected effects. The rights to privacy and to equality and non-discrimination have been the most prominent frame of reference for the connection between the digital age and human rights. They are important rights in and of themselves and have served as springboards for gaining traction in the conversation about the impact of the digital age on individuals and society. This report has built on that foundation to show how these two rights also play a gatekeeping role, whereby interferences with privacy or discrimination can lead to the violation of a range of other rights. It has also explored how big data and AI implicate a range of human rights and areas of life. Instead of taking a right-by-right approach, the analysis has been underpinned and guided by the universal, indivisible, interdependent, and interrelated character of human rights.

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[137] David Kaye, UN Special Rapporteur on the promotion and protection of the right to freedom of expression, 'Report to the General Assembly', UN Doc. A/73/348, 29 August 2018, 58.

II.   HOW DOES THE HUMAN RIGHTS FRAMEWORK HELP ADDRESS THESE CHALLENGES?

As data-driven technologies continues to develop and becomes ever more sophisticated, and as they are applied across more and more contexts, the threats as well as the opportunities for human rights increase.[138] It is our view that, in order to effectively address these threats while at the same time benefiting from technological opportunities, a human rights-based approach (HRBA) needs to be embedded in the design, development and regulation of AI. An HRBA is built on the existing IHRL obligations of states and the responsibilities of businesses to respect, protect and fulfil human rights. However, it is wider than legal requirements in also encompassing the underpinning principles of the international human rights system borne out of the UDHR, such as inclusion and participation. It is a tool to assist in the operationalisation of human rights.[139]

In the context of big data and AI, an HRBA needs to be applied in two ways. First, big data and AI are already being used in a range of situations that have the potential to affect human rights as set out in Part I. Actors that are currently designing, developing and using these technologies need to apply an HRBA to their work. They therefore need to determine whether their existing uses of big data and AI are impacting on human rights and, if they are, they need to address these effects. Second, states and businesses are beginning to examine how individual and societal harm by AI might be addressed through dedicated policies, strategies and potential regulation.[140] In our view, the HRBA should sit at the heart of the future design and development of these technologies and the regulation of the AI sector, in whatever form this takes.

Although the international human rights framework developed out of the UDHR does not offer a comprehensive solution to the challenges of AI, the UN Secretary-General has explicitly recognised the need to align the use of new and rapidly developing technologies with the principles enshrined in the UDHR.[141] In light of this, the final

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[138] See, for example, Levin Kim et al., 'Artificial Intelligence & Human Rights: Opportunities & Risks' (*Berkman Klein Center for Internet & Society at Harvard University*, 25 September 2018).

[139] See Office of the UN High Commissioner for Human Rights, Human Rights Indicators: A Guide to Measurement and Implementation, HR/PUB/12/5 Geneva, 2012, 13, available at <https://www.ohchr.org/Documents/Publications/Human_rights_indicators_en.pdf>.

[140] See, for example, Partnership on AI, available at <https://www.partnershiponai.org/>; Australia Human Rights Commission, Human Rights and Technology Issues Paper, July 2018, available at <https://www.humanrights.gov.au/sites/default/files/document/publication/AHRC-Human-Rights-Tech-IP.pdf>; Government of Canada, Treasury Board of Canada Secretariat, Responsible Artificial Intelligence in the Government of Canada: Digital Disruption White Paper Series (Version 2.0, 10 April 2018), available at <https://docs.google.com/document/d/1Sn-qBZUXEUG4dVk909eSg5qvfbpNlRhzIefWPtBwbxY/edit>, 24; World Economic Forum, White Paper, How to Prevent Discriminatory Outcomes in Machine Learning, March 2018.

[141] UN Secretary General's Strategy on New Technologies, September 2018, available at <http://www.un.org/en/newtechnologies/>.

section of this report sets out the value and significant contributions an HRBA can make to current and future approaches to AI.

A. What a Human Rights-Based Approach Entails

An HRBA is centred on human rights standards and principles derived from the UDHR and other human rights instruments. It covers not just the substantive rights themselves but also the cross-cutting norms that should guide the procedures used for implementing these rights, such as universality and participation, as well as the criteria for assessing their impact, such as equality and inclusion.[142] An HRBA was originally developed as a tool to mainstream human rights in development activities but its use has since expanded to other sectors as human rights have become the standard for assessing the legitimacy of activities in the public domain. [143]

An HRBA asserts the importance of respect for human dignity and freedom,[144] universality and inalienability, equality and non-discrimination, indivisibility and inclusion, participation and empowerment, transparency and accountability, access to remedy, and the rule of law and good governance.[145] These principles are derived from a vision of the equal and inalienable moral worth of all human beings and the necessity of protecting basic human interests against concentrations of power. Human rights work therefore stresses the importance of agency, fairness, respect for diversity, and the protection of the most vulnerable. An HRBA furthers the realisation of human rights, and contributes to both the capacity of individuals to claim their rights as well as to duty-bearers to meet their obligations and responsibilities. It is grounded normatively in human rights standards and principles and operationally focused on the promotion and protection of human rights in a variety of human endeavours. As such, it is a valuable tool to operationalise human rights and provides a useful matrix to assess the performance of state obligations under the 'respect, protect, fulfil' framework, which later turned into practical guidance through the UN Guiding Principles on Human Rights.[146]

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[142] OHCHR, *Human Rights Indicators: A Guide to Measurement and Implementation* (2012) 38-41.

[143] UN Practitioners' Portal on Human Rights Based Approaches to Programming, 'The Human Rights Based Approach to Development Cooperation Towards a Common Understanding Among UN Agencies' (2003) available at <https://hrbaportal.org/the-human-rights-based-approach-to-development-cooperation-towards-a-common-understanding-among-un-agencies>; Office of the UN High Commissioner for Human Rights, A Human Rights-Based Approach to Data: Leaving No One Behind in the 2030 Development Agenda (2016), available at <https://www.ohchr.org/Documents/Issues/HRIndicators/GuidanceNoteonApproachtoData.pdf>.

[144] See, for example, Mark Latonero, 'Governing Artificial Intelligence: Upholding Human Rights & Dignity' (*Data & Society*, 10 October 2018).

[145] ibid. See also OHCHR, *Human Rights Indicators: A Guide to Measurement and Implementation* (2012) 13.

[146] ibid, 33-44.

B. Applying an HRBA to Existing Applications of Big Data and AI

As set out in the first part of this report, states, businesses and other actors already use big data and AI in a wide range of ways that may adversely affect human rights. While states and businesses may not have always introduced big data and AI with human rights explicitly in mind, their use of these technologies has not occurred in a legal vacuum. States already have obligations to prevent and protect human rights under international, regional and national laws, including in relation to the (in)action by third parties such as businesses.[147] While the scope and content of such standards are still developing, businesses have responsibilities to respect human rights.[148] In this respect, any existing harm to human rights needs to be identified and remedied both in terms of rectifying flaws in the system and in providing redress to any affected individuals.

A key challenge in this respect is the identification of when and how big data and AI are used by states and businesses as this is not always clear or transparent. The recent end of mission statement by the UN Special Rapporteur on Extreme Poverty on his visit to the UK underscored the difficulty in even mapping the way in which automation is employed in decision-making processes within the UK's Universal Credit system.[149] The Data Justice Lab at Cardiff University has similarly highlighted these challenges through its work in using Freedom of Information Requests to try to identify how big data and AI are used in decision-making processes by public bodies in the UK.[150] Other uses of big data and AI with the potential to impact human rights have only been

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[147] See, for example, the obligations contained within the International Covenant on Civil and Political Rights, and the International Covenant on Economic, Social and Cultural Rights, which together with the UDHR form the International Bill of Human Rights; UN, Human Rights Committee, *General Comment No. 31 on The Nature of the Legal Obligation Imposed on States Parties to the Covenant*, UN Doc. CCPR/C/21/Rev.1/Add. 13, 26 May 2004; UN, Committee on Economic Social and Cultural Rights, *General Comment No. 3 on The Nature of States Parties' Obligations (Art. 2, Para. 1 of the Covenant)*, UN Doc. E/1991/23, 14 December 1990. As for businesses, at the time of writing, the open-ended intergovernmental working group on transnational corporations and other business enterprises with respect to human rights has produced a zero draft of 'a legally binding instrument to regulate, in international human rights law, the activities of transnational corporations and other business enterprises', as mandated by UN Human Rights Council Resolution 26/9, see Legally Binding Instrument to Regulate, In International Human Rights Law, The Activities of Transnational Corporations and Other Business Enterprises, Zero Draft 16.7.2018, available at <https://www.ohchr.org/Documents/HRBodies/HRCouncil/WGTransCorp/Session3/DraftLBI.pdf>; See also UNGPs.

[148] At the time of writing, the open-ended intergovernmental working group on transnational corporations and other business enterprises with respect to human rights has produced a zero draft of 'a legally binding instrument to regulate, in international human rights law, the activities of transnational corporations and other business enterprises', as mandated by UN Human Rights Council Resolution 26/9, see Legally Binding Instrument to Regulate, In International Human Rights Law, The Activities of Transnational Corporations and Other Business Enterprises, Zero Draft 16.7.2018, available at <https://www.ohchr.org/Documents/HRBodies/HRCouncil/WGTransCorp/Session3/DraftLBI.pdf>; See also, UN, Report of The Special Representative of The Secretary-General on The Issue of Human Rights and Transnational Corporations and Other Business Enterprises, *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework*, UN Doc. A/HRC/17/31, 21 March 2011.

[149] Philip Alston, UN Special Rapporteur on extreme poverty and human rights, Statement on Visit to the United Kingdom (London, 16 November 2018), available at <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=23881&LangID=E>.

[150] Data Justice Lab, Written submission to the UN Special Rapporteur on extreme poverty and human rights consultation on the UK (14 September 2018, available at <https://www.ohchr.org/Documents/Issues/EPoverty/UnitedKingdom/2018/Academics/DataJusticeLabCardiffUniversity.pdf>.

made public due to the work of actors such as whistleblowers and investigative journalists, as demonstrated by the Facebook and Cambridge Analytica revelations.[151] Transparency is therefore an important element to ensure that the outputs of data and AI systems can be reviewed and scrutinised.[152] Transparency should not only be narrowly focused on the system in question, but should also include the policies and practices of the entity developing and deploying it in order to assess the effects of AI within a wider process. Where big data and AI are being used in ways that have the potential to affect people's lives, an HRBA requires transparency at each stage of the data life-cycle and AI system and in the process as a whole. This means that there should be clear explanations as to why, on what basis and for what purpose the decision was taken to use big data and AI. With that broader view, transparency is valuable not only in and of itself, but also contributes to accountability.

In light of the potential effects of current uses of big data and AI on human rights, where they have not already, states and businesses should carry out full human rights impact assessments of their current uses of big data and AI. Impact assessments are stock processes for both states and businesses in all areas of their work. A human rights impact assessment checks the compatibility of the use of big data and AI against the international human rights framework and identifies the areas where further attention is needed to mitigate the possible negative effects of a process on human rights. In theory, a human rights impact assessment should be carried out at the beginning of any project and then be followed by continuous monitoring and evaluation. If the project is already ongoing, the impact assessment may prove useful in mitigating current adverse effects on human rights or avoiding further harm. In our view, these processes would be strongest if carried out with independent participation and oversight. A framework for independent oversight can include a combination of parliamentary committees, judicial or quasi-judicial bodies and dedicated courts.[153] An oversight body should review, investigate and continuously monitor the uses of big data and AI, in a transparent way. This requires appropriate and adequate resources, expertise and competencies.[154]

If the assessments identify any impact to human rights, this should result in two key actions. First, the state or business should take action to end any negative effects of big data and AI on human rights, for example, by

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[151] The Guardian, 'The Cambridge Analytica Files', available at <https://www.theguardian.com/news/series/cambridge-analytica-files>.
[152] See, for example, Eddie Copeland, '10 principles for public sector use of algorithmic decision making' (*NESTA*, 20 February 2018) available at <https://www.nesta.org.uk/blog/10-principles-for-public-sector-use-of-algorithmic-decision-making/>.
[153] HRBDT, 'Written submission to OHCHR: The Right to Privacy in the Digital Age' (2018) available at <https://www.ohchr.org/Documents/Issues/DigitalAge/ReportPrivacyinDigitalAge/HRBDT.pdf>, 17.
[154] ibid, 21.

redesigning the algorithm or removing automation from a decision-making process. Second, they should notify any affected individuals or groups so that they can seek redress. This is a critical step as individuals may not even know they are affected or that a particular decision, such as the receipt of social care, was reached by a process that in part involved AI. However, an HRBA should lead to the realisation that the right to a remedy is distinct from technical rectification of system-level faults.[155] Indeed, it encompasses three key elements – prevention, redress, and non-recurrence – and is not limited to retrospective measures after a violation might have occurred. This understanding of remedies should feature centrally in policies, practices and the agenda of states and business enterprises in the digital age. [156]

The role of actors such as civil society and investigative journalists has been pivotal in identifying the risks of particular applications of AI and deficiencies in oversight and accountability processes. Their role in continuing to document the effects of current uses of AI will be essential to addressing the harm it is already causing and to remedying it, including through approaches such as strategic litigation. Given that human rights define the relationship between the state and the individual, and between individuals and other duty bearers such as businesses, a robust civil society is an indispensable medium to defend and promote human rights - to catalyse action by duty-bearers, to advocate for remedy, to create awareness and to shape the debate.[157] Acting as a voice for individuals and groups,[158] civil society oversight can uncover and highlight problematic policies and practices, and mount challenges, for example through strategic litigation, which are important contributions for accountability. This is an important complement to, but not a substitute for, formal independent oversight.

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[155] ibid.

[156] UN, Report of The Special Representative of The Secretary-General on The Issue of Human Rights and Transnational Corporations and Other Business Enterprises, *Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework*, UN Doc. A/HRC/17/31, 21 March 2011 (hereinafter UNGPs), Pillar 3.

[157] Peggy Hicks, 'Human Rights Diplomacy: The NGO Role' in Michael O'Flaherty et al (eds.), *Human Rights Diplomacy: Contemporary Perspectives* (Brill, 2011)

[158] See, for example, UN, Joint statement by a group of United Nations human rights experts, 'A central role for a civil society is the only way to guarantee inclusive post-2015 development goals', 18 May 2015, available at <https://www.ohchr.org/en/newsevents/pages/DisplayNews.aspx?NewsID=15970&LangID=E>.

C. Putting Human Rights at the Centre of the Design and Development and Regulation of AI

The previous section proposes ways in which to ensure that current uses of AI comply with existing human rights obligations and responsibilities of states and businesses. These are proposals aimed at ceasing violations where they are taking place and rectifying and remedying harm that has already happened to human rights. However, the threats to human rights posed by big data and AI also require a forward-looking commitment by placing human rights at the centre of the design and development and regulation of AI, through the adoption of an HRBA. This would enable any adverse effects to be prevented from materialising in the first place and the identification of harm at an early stage, such that it could be stopped as quickly as possible.

This report comes at a timely moment as both states and businesses are currently examining the appropriate frameworks for the design and development of AI and the regulation of the AI sector.[159] This is reflected in a number of principles on AI issued by large technology companies and the discussion of how to address individual and societal harm in a number of national AI strategies, policies and plans published by states over the last year.[160] While some of these documents refer to human rights, we suggest that they would all benefit from the systematic inclusion of an HRBA within their approaches to the design and development and regulation of AI whether through multilateral, state or self-regulation. Beyond reflecting states' obligations and businesses' responsibilities, an HRBA has three additional benefits as an organising framework for the design and development of AI and the regulation of the sector, as outlined below.

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[159] See, for example, Access Now, 'Human Rights in the Age of Artificial Intelligence' (8 November 2018), available at <https://www.accessnow.org/cms/assets/uploads/2018/11/AI-and-Human-Rights.pdf> for some stakeholder-specific recommendations. See, for example, D Allison-Hope, 'Artificial Intelligence: A Rights-Based Blueprint for Business, Paper 2: Beyond the Technology Industry' (*Business for Social Responsibility*, August 2018) for business-specific recommendations.

[160] See, for example Institute of Electrical and Electronics Engineers Global Initiative on Ethics of Autonomous and Intelligent Systems, 'Ethically Aligned Design: A Vision for Prioritizing Human Well-Being with Autonomous and Intelligent Systems (Version 2)', available at <https://ethicsinaction.ieee.org/>; Sundar Pichai, 'AI at Google: Our Principles'*,* 7 June 2018) available at <https://www.blog.google/technology/ai/ai-principles/>; Microsoft, 'AI Principles', available at < https://www.microsoft.com/en-us/ai/our-approach-to-ai>; Australia Human Rights Commission, 'Human Rights and Technology Issues Paper' (July 2018) available at <https://www.humanrights.gov.au/sites/default/files/document/publication/AHRC-Human-Rights-Tech-IP.pdf>; CIFAR, Pan-Canadian Artificial Intelligence Strategy, available at <https://www.cifar.ca/ai/pan-canadian-artificial-intelligence-strategy>; NITI Aayog, National Institution for Transforming India, 'National Strategy for Artificial Intelligence #AIFORALL' (June 2018), available at <http://niti.gov.in/writereaddata/files/document_publication/NationalStrategy-for-AI-Discussion-Paper.pdf>; AI Singapore, available at <https://www.aisingapore.org/>; UK House of Lords Select Committee on Artificial Intelligence, 'AI in the UK: ready, willing, able?', Report of Session 2017-19, HL 16 April 2018, available at <https://publications.parliament.uk/pa/ld201719/ldselect/ldai/100/100.pdf>.

1. An HRBA Provides a Common Language to Frame Harms

First, since an HRBA encompasses states' existing obligations under IHRL as well as businesses' responsibilities to respect human rights, it provides clear parameters as to what is and is not permitted and the actions states and businesses have to take under existing international law. This is an important point of framing as some of the current approaches to AI can imply that the design and development and regulation of these technologies and the AI sector is starting from first principles, whereas regulatory debates should start with the applicability of existing laws which includes IHRL. An HRBA provides clear and consistent guidance and a common language to understand the harm and a baseline for the types of expected actions states and businesses should take to respect human rights.

2. An HRBA Helps to Identify and Operationalise a Common Objective for the Development of AI for All

Second, the litmus test for the design and development of AI should be that innovation does not only privilege certain individuals, organisations or groups but benefits society as a whole, including by empowering persons in vulnerable situations, in order to enable everyone to participate in and benefit from scientific and technological progress. An HRBA provides an organising framework to approach AI in this way by focusing on human agency, capability and flourishing, and clearly articulates the underlying conditions that help facilitate the development and deployment of technology for societal good. Article 27 of the UDHR states that '[e]veryone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.'[161]

The right to benefit from scientific progress has been recognised in subsequent international and regional human rights instruments,[162] and the value of science and technology has been noted by the UN General

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[161] UDHR, Article 27(1).

[162] For international instruments, see International Covenant on Economic, Social and Cultural Rights, Article 15(1)(b). For regional instruments, see, for example, Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, Article 14(1)(b); League of Arab States, Arab Charter on Human Rights, 15 September 1994, Article 42(1). See, also, Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind UNGA Res 3384 (XXX) UN Doc. A/RES/30/3384, 10 November 1975, available at <https://www.ohchr.org/EN/ProfessionalInterest/Pages/ScientificAndTechnologicalProgress.aspx>. For an overview of international and regional law and for more information on the normative content of this right see Farida Shaheed, Special Rapporteur in the Field of Cultural Rights Report on 'The right to enjoy the benefits of scientific progress and its applications', UN Doc. A/HRC/20/26, 14 May 2012, 1, 7-12, 25-48; UN, Office of

Assembly.[163] The right has been 'greatly neglected over the years'[164] but 'has a great deal of unexploited potential',[165] not least because it links with, and sometimes is the prerequisite for,[166] a range of other rights. Some linkages include the right to health,[167] to food,[168] and freedom of expression,[169] as well as with rights holders, such as older persons[170] and persons with disabilities.[171] This is significant as the rights to equality and non-discrimination are not standalone rights but rather intersect with and implicate other rights when threatened.

An HRBA facilitates the operationalisation of the right to benefit from scientific progress by delineating the specific attributes of the right, such as accessibility, affordability, avoidance of harm, intellectual freedom, and diffusion.[172] Accessibility is central to addressing inequality in the digital age. A core principle is that 'innovations essential for a life with dignity should be accessible to everyone, in particular marginali[s]ed populations'.[173] The benefits of science should be both 'physically available and economically affordable on a non-discriminat[ory] basis' in order to adequately address inequality.[174] As such, the accessibility requirement contributes to addressing the issues of the digital divide and concentration of power highlighted in the risks above. However, ensuring the mere accessibility to the end product does not ensure the participation in its development, nor participation in its oversight mechanisms, both key components of the right to benefit from scientific

the UN High Commissioner for Human Rights, Report on the Seminar on the Right to Enjoy the Benefits of Scientific Progress and its Applications, UN Doc. A/HRC/26/19, 1 April 2014, 8-13. For a comprehensive overview of the right to science as of 2013, see, for example, Margaret Weigers Vitullo and Jessica Wyndham, 'Defining the Right to Enjoy the Benefits of Scientific Progress and Its Applications: American Scientists' Perspectives' (AAAS Science and Human Rights Coalition, October 2013), available at <https://www.aaas.org/sites/default/files/content_files/UNReportAAAS.pdf>.

[163] Declaration on Social Progress and Development, UNGA Res 2542 (XXIV) UN Doc. A/RES/24/2542, 11 December 1969, preambular para 12; Declaration on the Use of Scientific and Technological Progress in the Interests of Peace and for the Benefit of Mankind UNGA Res 3384 (XXX) UN Doc. A/RES/30/3384, 10 November 1975, preambular para 1.

[164] UN, Office of the UN High Commissioner for Human Rights, Report on the Seminar on the Right to Enjoy the Benefits of Scientific Progress and its Applications UN Doc. A/HRC/26/19, 1 April 2014, 6.

[165] See, for example, William Schabas, 'Study of the Right to Enjoy the benefits of Scientific and Technological Progress and its Applications' in Yvonne Donders and Vladimir Volodin (eds), *Human Rights in Education, Science and Culture: Legal Developments and Challenges* (Ashgate 2007) 273.

[166] Farida Shaheed, UN Special Rapporteur in the Field of Cultural Rights, Report on 'The Right to Enjoy the Benefits of Scientific Progress and its Applications', UN Doc. A/HRC/20/26, 14 May 2012, 23.

[167] See, for example, Yvonne Donders, 'The right to enjoy the benefits of scientific progress: in search of state obligations in relation to health' (2011) 14(4) Medicine, Health Care and Philosophy 371–381.

[168] See, for example, Olivier De Schutter, 'The Right of Everyone to Enjoy the Benefits of Scientific Progress and the Right to Food' (2011) 33(2) Human Rights Quarterly 304-350.

[169] Farida Shaheed, UN Special Rapporteur in the Field of Cultural Rights, Report on 'The Right to Enjoy the Benefits of Scientific Progress and its Applications', UN Doc. A/HRC/20/26, 14 May 2012, 21.

[170] UN, Committee on Economic, Social and Cultural Rights. *General Comment No. 6 on The Economic, Social and Cultural Rights of Older Persons*, UN Doc. E/1996/22, 8 December 1995, 39, 42.

[171] UN, Office of the UN High Commissioner for Human Rights, Report on the Seminar on the Right to Enjoy the Benefits of Scientific Progress and its Applications UN Doc. A/HRC/26/19, 1 April 2014, 22.

[172] Farida Shaheed, UN Special Rapporteur in the Field of Cultural Rights, Report on 'The Right to Enjoy the Benefits of Scientific Progress and its Applications', UN Doc. A/HRC/20/26, 14 May 2012, pages 9-13.

[173] ibid, 29.

[174] ibid, 30, 31, 34.

development. The identification of specific attributes and relevant cross-cutting norms such as non-discrimination and participation, enables more effective and measurable implementation of duty-bearers' obligations and responsibilities. One way in which this could be implemented is through accessible and universal design, so that AI serves everyone without leaving some people behind. This will be useful to mitigate the disparate impacts of AI, such as on persons with disabilities.[175]

3. An HRBA Can Facilitate Multilateral and Multi-Stakeholder Approaches to AI

Third, the surge in the use of big data and the advancements in AI have expanded the number of actors engaged in this landscape.[176] In addition to states, businesses, in particular technology companies, are playing an increasingly prominent role as the developers, suppliers, and users of such technologies, and cooperating or complying with state requests in this context.[177] Greater corporate involvement in activities that were traditionally state-roles has seen a shift of the power balances in the intricate web of relationships in this multi-stakeholder ecosystem.[178] This polymorphous range of actors, in addition to the global nature of AI, suggests that multilateral and multi-stakeholder approaches are critical to addressing the challenges and opportunities presented by AI. Indeed, the UN Secretary-General has reflected that multilateralism is 'the only path to address the world's troubles'.[179] This is because multilateralism brings many unique benefits, such as increasing transparency amongst states through information exchange about policies and practices; reducing transaction costs by delegation to institutions rather than negotiating individually with each stakeholder; facilitating learning of good practice; generating socialisation of a wide range of states and actors through persuasion or mimicry;

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[175] Australian Human Rights Commission, 'Human Rights and Technology Issue Paper' (July 2018), Section 7 on Accessible Technology, 36-43, available at <https://www.humanrights.gov.au/sites/default/files/document/publication/AHRC-Human-Rights-Tech-IP.pdf>; European Disability Forum, 'Artificial Intelligence Must Serve Everyone' (16 November 2018), available at <http://www.edf-feph.org/newsroom/news/artificial-intelligence-must-serve-everyone-event-report>.

[176] UNESCO, 'Towards a monopolization of research in artificial intelligence?', 20 July 2018, available at <http://www.unesco.org/new/en/natural-sciences/science-technology/single-view-sc-policy/news/towards_a_monopolization_of_research_in_artificial_intellige/>; Darrell M. West and John R. Allen, 'How artificial intelligence is transforming the world', (Brookings, 24 April 2018), available at <https://www.brookings.edu/research/how-artificial-intelligence-is-transforming-the-world/>.

[177] David Kaye, UN Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Report on 'Freedom of expression, states and the private sector in the digital age', UN Doc. A/HRC/32/38, 11 May 2016.

[178] Frank Pasquale, 'From Territorial to Functional Sovereignty: The Case of Amazon', (*Law and Political Economy,* 6 December 2017), available at <https://lpeblog.org/2017/12/06/from-territorial-to-functional-sovereignty-the-case-of-amazon/amp/>; Olivia Solon and Sabrina Siddiqui, 'Forget Wall Street – Silicon Valley is the new political power in Washington', *The Guardian* (London, 3 September 2017), available at <https://www.theguardian.com/technology/2017/sep/03/silicon-valley-politics-lobbying-washington>

[179] UN, Secretary-General, 'Multilateralism: The only path to address the world's troubles, signals Guterres', 14 August 2018, available at <https://news.un.org/en/story/2018/08/1017012>.

deepening shared understandings and norms of behaviour; and responding to the global scope of the challenges.[180]

Adopting an HRBA to multilateral and multi-stakeholder engagement on AI is particularly important.[181] As the government of Canada has noted, an HRBA is of value in multilateral negotiations.[182] In its original contexts of gender-mainstreaming and development cooperation, an HRBA proved an effective vehicle to bring together diverse epistemic, functional and advocacy communities to organise and mobilise around a shared normative frame.[183] An HRBA offers a common frame for multi-stakeholder and multilateral efforts aimed at addressing the harms and opportunities presented by AI.

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[180] See Barbara Koremenos et al, "The Rational Design of International Institutions" (2001) 55(4) International Organisation 761, 761-779 for a discussion of different types of design features and their strengths and challenge. See also, Ryan Goodman & Derek Jinks, 'How to Influence States: Socialization and International Human Rights Law' (2004) 54(3) Duke Law Journal 621, 621-703; and Robert Keohane, 'A Functional Theory of International Regimes', In Robert Kehoane, A*fter Hegemony: Cooperation and Discord in the World Political Economy* (Princeton University Press 1984), 85-109.

[181] Michelle Bachelet, UN High Commissioner for Human Rights, 'Promotion and protection of human rights: comprehensive implementation of and follow-up to the Vienna Declaration and Programme of Action', 15 October 2018, available at <https://www.ohchr.org/EN/NewsEvents/Pages/DisplayNews.aspx?NewsID=23724&LangID=E>.

[182] Government of Canada, Treasury Board of Canada Secretariat, 'Responsible Artificial Intelligence in the Government of Canada: Digital Disruption' (White Paper Series - Version 2.0, 10 April 2018), 24, available at <https://docs.google.com/document/d/1Sn-qBZUXEUG4dVk909eSg5qvfbpNlRhzIefWPtBwbxY/edit>. See also, Government of Canada, Written evidence to the UK House of Lords Select Committee on Artificial Intelligence (AIC0222), 21 September 2017, (Response to Question 2), available at <http://data.parliament.uk/writtenevidence/committeeevidence.svc/evidencedocument/artificial-intelligence-committee/artificial-intelligence/written/70522.html>.

[183] Mary Robinson, 'What Rights Can Add to Good Development Practice' in Philip Alston and Mary Robinson (eds), *Human Rights and Development: Towards Mutual Reinforcement* (OUP 2005).

CONCLUSION

This report has illustrated the wide-ranging risks and opportunities posed by big data and AI are to human rights. In order to effectively address these risks and opportunities it is critical that IHRL underpins the consideration of all risks and opportunities, and any approach to the design, development and deployment of new technologies. In examining governance solutions, the focus should be on ensuring that the human rights framework developed over the last 70 years is effectively applied and adapted to new and emerging issues. There is no need to reinvent the wheel. Rather, the challenge is to effectively implement and operationalise the existing framework, and to apply it to both state and non-state actors, so that human rights are protected and promoted in the digital age.

Inspired by the UDHR, this report recommends that states and businesses should apply a human rights-based approach (HRBA) to existing and future applications of these technologies. An HRBA provides a common language to frame harms, offering clear parameters as to what is and is not permitted under international human rights law. Specific human rights principles such as accessibility, affordability, avoidance of harm, and intellectual freedom can also contribute to addressing issues of marginalisation, discrimination and the digital divide. At the heart of the design, development and use of big data and AI should be the right to benefit from scientific progress (Article 27 UDHR). This can help to ensure that the emergence of new technology serves societal goals.

Responding to new and emerging technologies is an inherently difficult task, given the pace and nature of technological developments. However, this is a challenge that the international community must face head on. As the preamble to the UDHR prescribes, progressive measures have to be activated at the national and international level to secure the 'universal and effective recognition and observance' of the enduring rights and freedoms enshrined in the UDHR and elaborated in subsequent treaties and declarations.[184]

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[184] UDHR, preambular para 8.

We argue that an HRBA needs to be applied in two ways:

- **Applying an HRBA to Existing Uses of AI**

Big data and AI are already being used in a range of situations that have the potential to affect human rights. Actors that are currently designing, developing and using these technologies need to apply an HRBA to their work. This requires transparency to where, when, how and why big data and AI are being used. It also requires ongoing human rights impact assessments to determine whether their existing uses of big data and AI are impacting on human rights and the establishment of accountability and independent oversight processes. Individuals and groups also need to be notified of harm and have access to an effective remedy. An effective remedy should ensure three key elements: prevention, redress and non-recurrence. In the context of big data and AI, remedy should rectify flaws in the system and provide redress to any affected individuals.

- **Embedding an HRBA in AI Policies, Strategies and Regulation**

States and businesses are beginning to examine how individual and societal harm by AI might be addressed through dedicated policies, strategies and potential regulation.[185] In our view, the HRBA should sit at the heart of the future design, development and deployment of these technologies and the regulation of the AI sector, in whatever form this takes.

A multilateral and multi-stakeholder approach is required to address issues arising in the context of big data and AI. This report argues that an HRBA is an effective vehicle to bring together the different actors active in this field, including states, business enterprises, and civil society, in order to address the challenges and opportunities presented by big data and AI. This should embed an understanding of the cross-cutting effects of big data and AI on the wide spectrum of human rights, consistent with the principles of universality, inalienability, indivisibility, interdependence and interrelatedness of human rights. The objective is to ensure that technological developments serve societal interests, and contribute towards the protection and promotion of human rights for all.

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[185] See, for example, Partnership on AI, available at <https://www.partnershiponai.org/>; Australia Human Rights Commission, Human Rights and Technology Issues Paper, July 2018, available at <https://www.humanrights.gov.au/sites/default/files/document/publication/AHRC-Human-Rights-Tech-IP.pdf>; Government of Canada, Treasury Board of Canada Secretariat, Responsible Artificial Intelligence in the Government of Canada: Digital Disruption White Paper Series (Version 2.0, 10 April 2018), available at <https://docs.google.com/document/d/1Sn-qBZUXEUG4dVk909eSg5qvfbpNlRhzIefWPtBwbxY/edit>, 24; World Economic Forum, White Paper, How to Prevent Discriminatory Outcomes in Machine Learning, March 2018.

THE UNIVERSAL DECLARATION OF HUMAN RIGHTS

Preamble

Whereas recognition of the inherent dignity and of the equal and inalienable rights of all members of the human family is the foundation of freedom, justice and peace in the world,

Whereas disregard and contempt for human rights have resulted in barbarous acts which have outraged the conscience of mankind, and the advent of a world in which human beings shall enjoy freedom of speech and belief and freedom from fear and want has been proclaimed as the highest aspiration of the common people,

Whereas it is essential, if man is not to be compelled to have recourse, as a last resort, to rebellion against tyranny and oppression, that human rights should be protected by the rule of law,

Whereas it is essential to promote the development of friendly relations between nations,

Whereas the peoples of the United Nations have in the Charter reaffirmed their faith in fundamental human rights, in the dignity and worth of the human person and in the equal rights of men and women and have determined to promote social progress and better standards of life in larger freedom,

Whereas Member States have pledged themselves to achieve, in co-operation with the United Nations, the promotion of universal respect for and observance of human rights and fundamental freedoms,

Whereas a common understanding of these rights and freedoms is of the greatest importance for the full realization of this pledge,

Now, Therefore THE GENERAL ASSEMBLY proclaims THIS UNIVERSAL DECLARATION OF HUMAN RIGHTS as a common standard of achievement for all peoples and all nations, to the end that every individual and every organ of society, keeping this Declaration constantly in mind, shall strive by teaching and education to promote respect for these rights and freedoms and by progressive measures, national and international, to secure their universal and effective recognition and observance, both among the peoples of Member States themselves and among the peoples of territories under their jurisdiction.

Article 1.
All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood.

Article 2.
Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status. Furthermore, no distinction shall be made on the basis of the political, jurisdictional or international status of the country or territory to which a person belongs, whether it be independent, trust, non-self-governing or under any other limitation of sovereignty.

Article 3.
Everyone has the right to life, liberty and security of person.

Article 4.
No one shall be held in slavery or servitude; slavery and the slave trade shall be prohibited in all their forms.

Article 5.
No one shall be subjected to torture or to cruel, inhuman or degrading treatment or punishment.

Article 6.
Everyone has the right to recognition everywhere as a person before the law.

Article 7.
All are equal before the law and are entitled without any discrimination to equal protection of the law. All are entitled to equal protection against any discrimination in violation of this Declaration and against any incitement to such discrimination.

Article 8.
Everyone has the right to an effective remedy by the competent national tribunals for acts violating the fundamental rights granted him by the constitution or by law.

Article 9.
No one shall be subjected to arbitrary arrest, detention or exile.

Article 10.
Everyone is entitled in full equality to a fair and public hearing by an independent and impartial tribunal, in the determination of his rights and obligations and of any criminal charge against him.

Article 11.
(1) Everyone charged with a penal offence has the right to be presumed innocent until proved guilty according to law in a public trial at which he has had all the guarantees necessary for his defence.
(2) No one shall be held guilty of any penal offence on account of any act or omission which did not constitute a penal offence, under national or international law, at the time when it was committed. Nor shall a heavier penalty be imposed than the one that was applicable at the time the penal offence was committed.

Article 12.
No one shall be subjected to arbitrary interference with his privacy, family, home or correspondence, nor to attacks upon his honour and reputation. Everyone has the right to the protection of the law against such interference or attacks.

Article 13.
(1) Everyone has the right to freedom of movement and residence within the borders of each state.
(2) Everyone has the right to leave any country, including his own, and to return to his country.

Article 14.
(1) Everyone has the right to seek and to enjoy in other countries asylum from persecution.
(2) This right may not be invoked in the case of prosecutions genuinely arising from non-political crimes or from acts contrary to the purposes and principles of the United Nations.

Article 15.
(1) Everyone has the right to a nationality.
(2) No one shall be arbitrarily deprived of his nationality nor denied the right to change his nationality.

Article 16.
(1) Men and women of full age, without any limitation due to race, nationality or religion, have the right to marry and to found a family. They are entitled to equal rights as to marriage, during marriage and at its dissolution.
(2) Marriage shall be entered into only with the free and full consent of the intending spouses.
(3) The family is the natural and fundamental group unit of society and is entitled to protection by society and the State.

Article 17.
(1) Everyone has the right to own property alone as well as in association with others.
(2) No one shall be arbitrarily deprived of his property.

Article 18.
Everyone has the right to freedom of thought, conscience and religion; this right includes freedom to change his religion or belief, and freedom, either alone or in community with others and in public or private, to manifest his religion or belief in teaching, practice, worship and observance.

Article 19.
Everyone has the right to freedom of opinion and expression; this right includes freedom to hold opinions without interference and to seek, receive and impart information and ideas through any media and regardless of frontiers.

Article 20.
(1) Everyone has the right to freedom of peaceful assembly and association.
(2) No one may be compelled to belong to an association.

Article 21.
(1) Everyone has the right to take part in the government of his country, directly or through freely chosen representatives.
(2) Everyone has the right of equal access to public service in his country.
(3) The will of the people shall be the basis of the authority of government; this will shall be expressed in periodic and genuine elections which shall be by universal and equal suffrage and shall be held by secret vote or by equivalent free voting procedures.

Article 22.
Everyone, as a member of society, has the right to social security and is entitled to realization, through national effort and international co-operation and in accordance with the organization and resources of each State, of the economic, social and cultural rights indispensable for his dignity and the free development of his personality.

Article 23.
(1) Everyone has the right to work, to free choice of employment, to just and favourable conditions of work and to protection against unemployment.
(2) Everyone, without any discrimination, has the right to equal pay for equal work.
(3) Everyone who works has the right to just and favourable remuneration ensuring for himself and his family an existence worthy of human dignity, and supplemented, if necessary, by other means of social protection.
(4) Everyone has the right to form and to join trade unions for the protection of his interests.

Article 24.
Everyone has the right to rest and leisure, including reasonable limitation of working hours and periodic holidays with pay.

Article 25.
(1) Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control.
(2) Motherhood and childhood are entitled to special care and assistance. All children, whether born in or out of wedlock, shall enjoy the same social protection.

Article 26.
(1) Everyone has the right to education. Education shall be free, at least in the elementary and fundamental stages. Elementary education shall be compulsory. Technical and professional education shall be made generally available and higher education shall be equally accessible to all on the basis of merit.
(2) Education shall be directed to the full development of the human personality and to the strengthening of respect for human rights and fundamental freedoms. It shall promote understanding, tolerance and friendship among all nations, racial or religious groups, and shall further the activities of the United Nations for the maintenance of peace.
(3) Parents have a prior right to choose the kind of education that shall be given to their children.

Article 27.
(1) Everyone has the right freely to participate in the cultural life of the community, to enjoy the arts and to share in scientific advancement and its benefits.
(2) Everyone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.

Article 28.
Everyone is entitled to a social and international order in which the rights and freedoms set forth in this Declaration can be fully realized.

Article 29.
(1) Everyone has duties to the community in which alone the free and full development of his personality is possible.
(2) In the exercise of his rights and freedoms, everyone shall be subject only to such limitations as are determined by law solely for the purpose of securing due recognition and respect for the rights and freedoms of others and of meeting the just requirements of morality, public order and the general welfare in a democratic society.
(3) These rights and freedoms may in no case be exercised contrary to the purposes and principles of the United Nations.

Article 30.
Nothing in this Declaration may be interpreted as implying for any State, group or person any right to engage in any activity or to perform any act aimed at the destruction of any of the rights and freedoms set forth herein.