

# Pharmaceutical Futures: Implications of the Human Rights of Future Generations for the Pharmaceutical Industry

Dr Thomas J W Peck, School of Law, Lancaster University

## Abstract

This article considers the implications of the Maastricht Principles on the Human Rights of Future Generations for the pharmaceutical industry. The Principles set out international human rights law's stance on the obligations and responsibilities of states and non-state actors regarding the human rights of future generations, rooted in environmental and intergenerational justice. The industry presents a conflicting duality between rights fulfilment and rights infringement, developing and providing essential medicines, whilst also contributing to environmental harms, inequitable innovation models, resource depletion and barriers to treatment. This paper argues that the Principles highlight core responsibilities for the industry. These not only relate to environmental reforms, but also the adoption of prospective due diligence; forward-looking innovation, reduction in barriers to access and the continued production of essential medicines. The paper concludes that whilst currently non-binding, the evolving international recognition of the rights of future generations and pressing climate crisis, places a growing normative and practical weight upon the pharmaceutical industry to adapt their approach to better account for the rights of future as well as current generations.

## Keywords:

Pharmaceuticals, Future Generations, Sustainability, Right to Health, Access to Medicines, Climate Change

### 1. Introduction

Society continues to strike a Faustian bargain with the pharmaceutical industry. Their research is critical for tackling diseases of the future, persistent inequalities and global health crises. Nevertheless, the negative impacts of the industry, ranging from environmental damage, exclusionary models of innovation and harmful pricing practices, raise serious questions for health and human rights scholarship. It is critical to consider how the industry can adapt to meet the healthcare needs of both current and future generations, whilst decreasing its negative impacts.

The Maastricht Principles on the Human Rights of Future Generations (The Principles)<sup>1</sup> arose from growing academic, political and public discourses surrounding environmental sustainability; drafted by world-leading scholars and human rights experts. The Principles contribute towards developing discourses surrounding environmental sustainability and the implications for rights protection for present and future generations. Against the backdrop of The Principle's adoption, and the subsequent publication of their Commentary,<sup>2</sup> this paper seeks to explore the implications of The Principles for the pharmaceutical industry, particularly the industry's role in medicine research, production and provision.

The Principles 'seek to clarify the present state of international law as it applies to the human rights of future generations',<sup>3</sup> building upon previous developments such as the UN Secretary General's report in intergenerational solidarity.<sup>4</sup> Subsequent international developments such as the UN Declaration on Future Generations,<sup>5</sup> provide even greater impetus to examine the implications as greater international focus and action continues. The Principles are a notable development in academic understanding of current responsibilities of state and non-state actors towards future generations and represent core ideas for the development of human right responsibilities in the face of a global climate crisis. These implications are academically, socially and environmentally important in numerous contexts, including the development, production and supply of medicines.

The Principles explicitly address non-state actors, including corporations,<sup>6</sup> outlining non-binding duties towards future generations. Necessarily, they take a broad approach, casting a wide net within which all corporations can be considered. Given this, it is not immediately clear how they apply to specific sectors such as the Pharmaceutical Industry. Given growing scholarly and political attention paid towards sustainability, environmental protection and future generations, it is likely that developments in international and domestic regulation of corporate action will occur in the coming years. There have already been several significant regulatory developments

---

<sup>1</sup> The Maastricht Principles on the Human Rights of Future Generations, July 2023. <https://www.rightsoffuturegenerations.org/the-principles> (accessed 10th December 2024), (The Principles)

<sup>2</sup> Gideon Basson and others, 'Commentary to the Maastricht Principles on the Human Rights of Future Generations' (2025) <<https://www.rightsoffuturegenerations.org/commentary>> accessed 20.10.2025.

<sup>3</sup> The Principles, supra n 1 at 1.

<sup>4</sup> UNGA, 'Report of the Secretary General on Intergenerational Solidarity and the Needs of Future Generations', (2013) UN Doc. A/68/322, 19-23.

<sup>5</sup> UNGA, 'The Pact for the Future: Declaration on Future Generations' (2024) UN Doc. A/RES/79/1.

<sup>6</sup> The Principles, supra n 1, Principle 25.

concerning the behaviour of corporations towards human rights.<sup>7</sup> At the UN level, a Draft Treaty on Business and Human Rights<sup>8</sup> is currently being drafted which brings corporate human rights due diligence onto the international agenda. Given these developments, alongside the growing attention on environmental rights and future generations, it is important to understand the implications of The Principles for corporations, such as the pharmaceutical industry.

This paper contributes towards the analysis of corporate accountability within Health and Human Rights scholarship, by considering the intergenerational implications of the pharmaceutical industry considering the Maastricht Principles. Health and Human Rights research is falling behind when it comes to analysing the impacts and implications of unsustainable business practices on the environment, equitable access to medicines and innovation pipelines. Recent developments in international human rights law clarify the obligation of states to mitigate climate impact<sup>9</sup> and recognise the right to a healthy environment.<sup>10</sup> Emergent literature considering the human rights of future generations finds kinship with such developments. Across disciplines, a growing focus is emerging upon sustainability, planetary boundaries<sup>11</sup> and de-growth, including in the context of human rights.<sup>12</sup> The Principles provide an opening to bring pharmaceutical human rights research into the conversation.

Given this, in this article I seek to provide a distinct theoretical contribution to the existing literature on the rights of future generations, as well as business and human rights literature, by

---

<sup>7</sup> For example: Council Directive 2024/1760 of 13 June 2024 on corporate sustainability and due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859 [2024 OJ L2024/1760. (EU Due Diligence Directive); Act relating to enterprises' transparency and work on fundamental human rights and decent working conditions (Transparency Act) 2022 (Norway); Corporate Duty of Vigilance Law 2017 (France)

<sup>8</sup> Updated draft legally binding instrument to regulate, in international human rights law, the activities of transnational corporations and other business enterprises, July 2023 (UN Draft Treaty on Business and Human Rights).

<sup>9</sup> Benoit Mayer, 'Climate Change Mitigation as an Obligation Under Human Rights Treaties?' (2021) 115 *American Journal of International Law* 409.

<sup>10</sup> UNHRC 'Resolution adopted by the Human Rights Council on 8 October 2021 on the human right to a clean, healthy and sustainable environment' (2021) UN Doc. A/HRC/RES/48/13; UNGA Res 76/300 (28<sup>th</sup> July 2022).

<sup>11</sup> Johan Rockström and others, 'Planetary Boundaries: Exploring the Safe Operating Space for Humanity' (2009) 14 *Ecology and Society* 32.

<sup>12</sup> Judith Bueno de Mesquita, 'Reinterpreting human rights in the climate crisis: Moving beyond economic growth and (un)sustainable development to a future with degrowth' (2024) 42 *Netherlands Quarterly of Human Rights* 90; Matthias Petel and Norman Vander Putten, 'Economic, social and cultural rights and their dependence on the economic growth paradigm: Evidence from the ICESCR system' (2021) 39 *Netherlands Quarterly of Human Rights* 53; Wouter Vandenhoele, 'De-Growth and Sustainable Development: Rethinking Human Rights Law and Poverty Alleviation' (2018) 11 *Law and Development Review* 647.

providing a more substantial understanding of how The Principles might be applied to, or have implications for, the Pharmaceutical Industry, Pharmaceutical Companies and the research, development, production and dissemination of pharmaceuticals. Through a qualitative, socio-legal methodology, I position the pharmaceutical industry within the framework of corporate responsibilities under international human rights law, emphasising the often-overlooked intersections with healthcare and intergenerational justice. I conduct an examination of the role of the pharmaceutical industry in the research, development, production and distribution of medicines. In doing so, I seek to draw out those idiosyncratic aspects of the industry which require specific insights beyond a more general analysis of the implications of The Principles for corporations more generally. I begin by considering the concept of 'rights' for future generations, examining the Principles' legal basis, alongside critiques of the notion of attributing rights to those who are yet to exist. Following this, I then examine the Principles conception of 'duties' towards future generations, both in terms of States, but also non-state actors such as pharmaceutical companies. Having laid this foundation, I consider the relevance of the pharmaceutical industry to the rights of future generations, before exploring the implication of the Principles for the industry. In doing so, I examine the environmental impact of the pharmaceutical industry, the research and development of novel medicines, information and intellectual property protection and finally, the continued development of existing medicines for the benefit of future generations.

I argue that whilst not holding binding obligations, corporations, including pharmaceutical companies have human rights responsibilities towards future generations. The pharmaceutical industry must consider its impacts upon future generations and the environment, including through 'greening' practices which seek to limit the environmental impact of production. In addition, the industry must consider how best to fulfil the needs of current generations, whilst being respectful of the rights of future generations to access essential medicines. This will necessarily require consideration of current and potential research practices and methods, not only in terms of the natural resources used, but also in terms of collaboration and information sharing, addressing intergenerational inequities within the development and provision of medicines.

## 2. The Concept of Rights for Future Generations

At both a cultural and instinctual level we understand some degree of responsibility towards those who succeed us. These feelings of moral duty are often strongest when considering our

children, grandchildren or close relatives.<sup>13</sup> Yet most cultures also accept the temporality of human life and the concurrent need to act as stewards of the planet for those who will come after.<sup>14</sup> Such innate senses have made their way into international law and discourse. Awareness of global climate change has intensified the importance of securing intergenerational equity and justice. Significant developments in environmental human rights,<sup>15</sup> intersect with the rights of future generations through the notion of intergenerational justice.<sup>16</sup> At its core, intergenerational justice recognises that climate change and environmental degradation will impact future generations more than any other group. This vulnerability is exacerbated by their non-existence, preventing autonomous actions to mitigate the harms they may experience. The duty to protect thus rests upon present generations. Environmental rights and the rights of future generations can thus be seen as twin emergent rights, which address increasing cognisance of environmental harms and intergenerational (in)justice. This intersection also provides a moral claim for rights of, and duties towards, future generations.<sup>17</sup> The imminent climate and planetary crisis necessitate the recognition of moral duties towards the planet and future generations.

Drawing upon these ideas of intergenerational equity and justice, The Principles are founded upon the idea that human rights apply equally to future generations,<sup>18</sup> as they do present generations, creating corresponding duties for both states and non-state actors. This idea is rooted in a theory of intertemporal universality<sup>19</sup> – that the universality of human rights applies throughout time. Interpretive support for this position can be found throughout international human rights documents. The Charter of the United Nations is explicit in its reference to the protection of ‘succeeding generations’<sup>20</sup> whilst, there is an absence of explicit time limitations within subsequent human rights treaties, such as the International Covenant on Economic,

---

<sup>13</sup> UNGA, supra n 4 at 10-11.

<sup>14</sup> Edith Brown Weiss, 'In Fairness to Future Generations and Sustainable Development' (1992) 8 American University International Law Review 19.

<sup>15</sup> See for example: OHCHR, 'Report of the Special Rapporteur on the Right to a clean, healthy and sustainable environment – Overview of the implementation of the human right to a clean, healthy and sustainable environment' (2<sup>nd</sup> August 2024) UN Doc. A/79/270.

<sup>16</sup> Richard P Hiskes, 'The Right to a Green Future: Human Rights, Environmentalism, and Intergenerational Justice' (2005) 27 Human Rights Quarterly 1346, 1347.

<sup>17</sup> Ibid, 1354.

<sup>18</sup> The Principles, supra n 1 at 1.

<sup>19</sup> Sigrun Skogly, 'The right to continuous improvement of living conditions and human rights of future generations – a circle impossible to square?' in Jessie Hohmann and Beth Goldblatt (eds), *The Right to the Continuous Improvement of Living Conditions: Responding to Complex Global Challenges*, (Hart 2021) ; Weiss, 'In Fairness to Future Generations and Sustainable Development', 21; Marcus Düwell and Gerhard Bos, 'Human rights and future people — Possibilities of argumentation' (2016) 15 Journal of Human Rights 231, 283; Bridget Lewis, 'Human Rights Duties towards Future Generations and the Potential for Achieving Climate Justice' (2017) 34 Netherlands Quarterly of Human Rights 206, 217.

<sup>20</sup> Charter of the United Nations (adopted 24<sup>th</sup> October 1945) 1 UNTS XVI, Preamble.

Social and Cultural Rights (ICESCR)<sup>21</sup> and the International Covenant on Civil and Political Rights (ICCPR).<sup>22</sup> Human rights therefore apply to all human beings without generational boundaries.<sup>23</sup>

The argument for recognising rights to future generations finds growing support across an array of international treaties, judgments and practices. Early references to the rights of future generations can be found in the UNESCO Declaration on the Responsibility of the Present Generations Towards Future Generations, which stresses the need to preserve cultural heritage and diversity for future generations.<sup>24</sup> Around the same time was the judgment of Justice Weeramantry of the International Court of Justice (ICJ) where he explicitly recognised the rights of future generations, drawing upon ideas of intergenerational equity and justice, and emphasising its moral importance throughout global cultures, religions and values.<sup>25</sup> Such early statements have struggled to venture beyond somewhat abstract discourse, yet recent developments (including The Principles) suggest growing legal and political recognition of the notion of future generations and their potential to be considered rights-holders. Against the backdrop of The Principles adoption, in its Advisory Opinion on the Obligation of States in respect of Climate Change, the ICJ held that:

“Due regard for the interests of future generations and the long-term implications of conduct are equitable considerations that need to be taken into account where States contemplate, decide on and implement policies and measures in fulfilment of their obligations under the relevant treaties and customary international law”<sup>26</sup>

There thus appears to be an emergent trend towards genuine recognition of future generations as rights-holders, something explicitly recognised by the Inter-American Court of Human Rights (IACtHR), particularly in relation to climate change and intergeneration equity;<sup>27</sup> including explicit reference to The Principles.<sup>28</sup> Whilst not explicitly recognising future generations as rights-

---

<sup>21</sup> International Covenant on Economic, Social and Cultural Rights (adopted 16<sup>th</sup> December 1966, entered into force 3<sup>rd</sup> January 1976) 993 UNTS 3 (ICESCR).

<sup>22</sup> International Covenant on Civil and Political Rights (adopted 16<sup>th</sup> December 1966, entered into force 23<sup>rd</sup> March 1976) 999 UNTS 171 (ICCPR).

<sup>23</sup> *ibid*, Principle 5 at 5.

<sup>24</sup> UNESCO, ‘Declaration On The Responsibility Of The Present Generations Towards Future Generations’ Resolution 44 of 29<sup>th</sup> Session (12 November 1997).

<sup>25</sup> Separate Opinion of Weeramantry J in *Gabčíkovo-Nagymaros Project (Hungary. v. Slovakia)* (Judgment) [1997] ICJ Rep 7, 88, 106–10.

<sup>26</sup> *Obligations of States in Respect of Climate Change* (Advisory Opinion) [2025] ICJ Rep 187, para 157.

<sup>27</sup> *Advisory Opinion Requested by the Republic of Chile and the Republic of Colombia: Climate Emergency and Human Rights* (IACtHR, AO-32/25, 29 May 2025).

<sup>28</sup> *Ibid*, para 307.

holders in a direct sense, in *Verein Klimaseniorinnen Schweiz v Switzerland*<sup>29</sup> the European Court of Human Rights stressed the importance of intergenerational equity and a rights-based approach towards the climate which inherently implicates future generations.<sup>30</sup>

Further references to future generations can be found in the work of the Committee on Civil and Political Rights (CCPR), who have recognised the importance of environmental protection for future generations as part of the right to life.<sup>31</sup> The Committee on Economic, Social and Cultural rights (CESCR) have also highlighted the need to fulfil human rights in a manner compatible with sustainability and the protection of the rights of future generations.<sup>32</sup> In the most recent draft General Comment on Economic Social and Cultural Rights and the Environmental Dimension of Sustainable Development, the CESCR also make clear the relevance and importance of the rights of future generations.<sup>33</sup> In particular, they reiterate the intertemporal nature of human rights, and reiterate the applicability of all human rights to future generations and the existence of concurrent state obligation to account for the rights of future generations in their decision-making and sustainable development practices.<sup>34</sup>

Extending the legal basis further, the rights of future generations have recently been recognised by the United Nations, through the UN Declaration on Future Generations in September 2024 as part of the ‘Summit of the Future’.<sup>35</sup> The Declaration makes clear the international communities commitment to future generations, including addressing intergenerational injustice,<sup>36</sup> protecting human rights<sup>37</sup> and tackling climate change.<sup>38</sup> The UN Declaration follows domestic legal developments which recognise the rights of future generations. In 2015 the Welsh Assembly

---

<sup>29</sup> *Verein Klimaseniorinnen Schweiz v Switzerland* App No. 53600/20 (Judgment, 9 April 2024).

<sup>30</sup> Luísa Netto, 'Resisting the Allure of Future Generations' Rights The ECtHR's Approach to Climate Action in *KlimaSeniorinn* (2024) <<https://voelkerrechtsblog.org/resisting-the-allure-of-future-generations-rights/>> accessed 17.10.2025; Aoife Nolan, 'Inter-generational Equity, Future Generations and Democracy in the European Court of Human Rights' *Klimaseniorinnen Decision* (2024) <<https://www.ejiltalk.org/inter-generational-equity-future-generations-and-democracy-in-the-european-court-of-human-rights-klimaseniorinnen-decision/>> accessed 17.10.2025.

<sup>31</sup> CCPR, 'General Comment 36 on article 6: right to life' (2019) CCPR/C/GC/36, para 62.

<sup>32</sup> CESCR, 'General Comment 12 on the right to adequate food' (1999) UN Doc. E/C.12/1999/5, para 7; CESCR, 'General Comment 15 on the right to water' (2003) UN Doc. E/C.12/2002/11, para 11 and 13; CESCR, 'General Comment 19 on the right to social security' (2008) UN Doc. E/C.12/GC/19, para 11; CESCR, 'General Comment 25 on science and economic, social and cultural rights' (2020) UN Doc. E/C.12/GC/25, para 56.

<sup>33</sup> CESCR, Draft General Comment on Economic, Social and Cultural Rights and the Environmental Dimension of Sustainable Development (Forthcoming, <https://www.ohchr.org/en/calls-for-input/2025/cescr-calls-written-contributions-draft-general-comment-economic-social-and>).

<sup>34</sup> *Ibid*, paras 91-93.

<sup>35</sup> UNGA, *supra* n 5.

<sup>36</sup> *Ibid*, para 3.

<sup>37</sup> *ibid*, para 2.

<sup>38</sup> *ibid*, para 18.

passed the Well-being of Future Generations (Wales) Act<sup>39</sup> which seeks to ensure that public bodies are operating in the interests of the future. The Welsh model has acted as a guide for the subsequent development of the UN Declaration<sup>40</sup> and more broadly represents the potential for domestic legislative implementation of measures to ensure the human rights of future generations.

The human rights of future generations are increasingly recognised under international human rights law, transitioning from statements of moral values to articulations of legal principles. This transition reflects growing acceptance of the need for the protection and application of human rights to transcend temporal boundaries, spurred on by the urgency of the climate crisis and concerns over sustainability and intergenerational equity. This includes not only the actions of states, but also non-state actors such as corporations. Within this context, the Maastricht Principles provide clarity on the role of corporate actors in relation to the human rights of future generations.

### 3. The Maastricht Principles and Corporate Human Rights Responsibilities

The Maastricht Principles affirm that the rights of future generations entail intergenerational duties and obligations<sup>41</sup> extending to non-state actors, such as corporations.<sup>42</sup> The actions of the present generation have significant implications for the protection and fulfilment of the human rights of future generations.<sup>43</sup> The environmental impact of current generations, as well as the depletion of natural resources each pose significant threats to the capability of future generations to fulfil their own human rights.<sup>44</sup> Intergenerational justice requires duties towards future generations and the environment, so that cultural and natural resources can be preserved and future generations may benefit from the diversity of options available to current generations.<sup>45</sup> It is therefore imperative to consider the requirements or duties held by state and non-state actors towards future generations.

---

<sup>39</sup> Well-Being of Future Generations (Wales) Act 2015 (WCFG Act 2015).

<sup>40</sup> Future Generations Commissioner for Wales, 'Wales celebrates landmark moment as the UN adopts declaration on future generations' (Future Generations Commission for Wales, 24<sup>th</sup> September 2024) <https://www.futuregenerations.wales/news/wales-celebrates-landmark-moment-as-the-un-adopts-declaration-on-future-generations/> accessed 10<sup>th</sup> December 2024.

<sup>41</sup> The Principles, supra n 1, Principles 7 and 8, at 6.

<sup>42</sup> *ibid*, Principle 25, at 17

<sup>43</sup> Skogly, supra n 19.

<sup>44</sup> Lewis supra n 19.

<sup>45</sup> Weiss, supra n 14 at 22-23.

### 3.1. Intergenerational Duties and Obligations

The Principles make clear the existence of duties and obligations towards the human rights of future generations. Principle 7 outlines the intra- and inter-generational human rights obligations of states.<sup>46</sup> These include addressing current human rights violations to avoid transmission to future generations;<sup>47</sup> respect for the rights of children, importantly considering how conduct might impact their rights in the future,<sup>48</sup> and finally to restrict activities which pose a threat to the rights of future generations, without undermining the rights fulfilment of present generations.<sup>49</sup> Principle 8 similarly focuses on intergenerational duties, stressing humankind's interconnection and reliance on the earth<sup>50</sup> which produces a clear duty to 'protect and sustain the Earth's natural and cultural heritage for future generations.'<sup>51</sup>

The Principles provide a significant level of detail which explores the nature of such obligations, broken down into the tripartite typology of respect, protect and fulfil.<sup>52</sup> They translate broad notions of intergenerational and environmental justice and equity, into actionable, quasi-legal standards; echoing Weiss' seminal work on future generations.<sup>53</sup> Weiss considers three core elements of duties towards future generations, consisting of the 'conservation of options' including the diversity of natural and cultural resources,<sup>54</sup> the 'conservation of quality'<sup>55</sup> and the 'conservation of access'.<sup>56</sup> In essence, they conceive of a general duty of present generations, towards future generations to provide them with a planet and environment which is in no worse condition than enjoyed currently, and in an idea world, better. These general principles have been endorsed by the UN Secretary General,<sup>57</sup> and are reflected in The Principles. What is clear from Weiss' approach is that these duties are not restricted States but speak more broadly to duties held by all towards future generations. Indeed, this approach too is reflected in The Principles,

---

<sup>46</sup> The Principles, supra n 1, Principle 7, at 6.

<sup>47</sup> *ibid*, Principle 7(a).

<sup>48</sup> *ibid*, Principle 7(b).

<sup>49</sup> *ibid*, Principles 7(c).

<sup>50</sup> *ibid*, Principle 8(a).

<sup>51</sup> *ibid*, Principle 8(b).

<sup>52</sup> *ibid*, Principles 13, 17, 18, 19, 20 and 21.

<sup>53</sup> Weiss, 'In Fairness to Future Generations and Sustainable Development'.

<sup>54</sup> Weiss, supra n 19 at 22.

<sup>55</sup> *ibid*,

<sup>56</sup> *ibid*, 23.

<sup>57</sup> UNGA, 'Report of the Secretary General on Intergenerational Solidarity and the Needs of Future Generations', (August 15<sup>th</sup> 2013) UN Doc. A/68/322/, 17-18.

which make clear that these duties extend to individuals,<sup>58</sup> communities,<sup>59</sup> inter-<sup>60</sup> and non-governmental organizations<sup>61</sup> and critically, corporations.<sup>62</sup>

### 3.2. The Duties of Non-State Actors Such as Corporations

Principle 25 directly addresses non-state actors (NSAs), including business enterprises<sup>63</sup> stressing the minimum expectation to *respect* the human rights of future generations.<sup>64</sup> This includes duties to refrain from activities which adversely affect the rights of future generations and to prevent harm to human rights which might occur through their products or services.<sup>65</sup> The Principles also prescribe specific action for corporations, requiring a 'clear policy commitment' to future generations;<sup>66</sup> compliance with a duty of care towards future generations within their supply chains, and a requirement to undertake human rights due diligence which accounts not only for present, but also future generations human rights.<sup>67</sup> In sum, the Principles establish a duty for corporations to undertake prospective due diligence for future generations. How this might be implemented in the context of the pharmaceutical industry is discussed below in sections 4 and 5 below. In addition, whilst the Principles refer only to the responsibility to *respect* rights, the Commentary to the Principles makes clear that this does not exclude certain actors from holding concurrent responsibilities to *protect* and *fulfil* rights (positive duties), for example if commissioned by the state to carry out public functions.<sup>68</sup> As shall be argued below, this position is particularly important in the context of pharmaceutical production, with Hunt and Lee making the case for positive duties, such as protection and fulfilment, being attributed to the pharmaceutical industry, in light of their integral societal role and function.<sup>69</sup>

Regardless, the content of any such duties owed to future generations is context dependent, concerning the rights-holders, the duty bearers, the environmental, social and cultural context and conditions within which the right is to be considered. When considering the right to health for future generations therefore, it is critical to consider the duties of both states and non-state

---

<sup>58</sup> The Principles, supra n 1, Principle 27(a), at 18.

<sup>59</sup> Ibid.

<sup>60</sup> Ibid, Principle 27(b), at 18.

<sup>61</sup> Ibid, Principle 26, at 18.

<sup>62</sup> Ibid, Principle 25, at 17.

<sup>63</sup> Ibid.

<sup>64</sup> Ibid, Principle 25(a), at 17.

<sup>65</sup> Ibid.

<sup>66</sup> Ibid, Principle 25(b), at 17

<sup>67</sup> Ibid.

<sup>68</sup> Commentary to the Maastricht Principles supra n 2, 156.

<sup>69</sup> Joo-Young Lee and Paul Hunt, 'Human Rights Responsibilities of Pharmaceutical Companies in Relation to Access to Medicines' (2012) 40 Journal of Law, Medicine and Ethics 220.

actors within this context. Similarly, when considering the duties of pharmaceutical companies, it is necessary to consider the context within which they operate, the actions and omissions of the industry which may have implications for the rights of future generations, and the numerous human rights which have direct relevance to this context. The net must therefore be cast wide to successfully encompass the system of rights and duties which arise within the pharmaceutical context. In the following section therefore, I explore the composition of the pharmaceutical industry, exploring its component parts, functions and aims. In doing so, I seek to provide an account of the multi-faceted nature of the industry, in a manner which provides a basis for analysing the implications of The Principles for these differing industrial functions and business models.

#### 4. Implications of The Principles for the Pharmaceutical Industry

##### 4.1. The Relevance of the Human Rights of Future Generations to the Pharmaceutical Industry

The Principles hold significance for the operation and practices of the pharmaceutical industry. Principle 25 explicitly addresses non-state actors, including business enterprises<sup>70</sup> placing a clear requirement to respect the rights of future generations.<sup>71</sup> The pharmaceutical industry, as an actor in the field of medicine and medical provision has a significant role to play in respecting, but also fulfilling human rights.<sup>72</sup> Considering both the positive and negative human rights impacts of the industry is critical for considering how to respond to The Principles and their implications for the industry, including the development of best practices.

The 'pharmaceutical industry' covers a broad range of corporations, covering several distinct functions, processes and product types. These include, inter alia, research and development of novel medicines and medical technologies, and the production of 'generic'<sup>73</sup> medicines. Access to these essential medicines is a minimum core right under the right to health,<sup>74</sup> and must therefore be provided by states. The industry thus plays a key role in the provision of medicines necessary to meet healthcare demands and access requirements under the right to health.

---

<sup>70</sup> *ibid*, Principle 25 at 17

<sup>71</sup> *ibid*, Principle 25(a) at 17

<sup>72</sup> Lee and Hunt, 'Human Rights Responsibilities of Pharmaceutical Companies in Relation to Access to Medicines', 228.

<sup>73</sup> 'Generic' medicines are those without patent protection. As such, they can be produced by any capable company, generally at lower costs and at a large scale.

<sup>74</sup> CESCR, 'General Comment 14 on the right to health' (2000) UN Doc E/C.12/2000/4, paras 12(a) and 43(d).

Individuals also have the right to benefit from scientific progress, which necessarily includes the development of novel medicines created by the pharmaceutical industry.<sup>75</sup> This is relevant for current generations, but also for future generations who may rely upon the developmental successes of current industry research to meet the healthcare needs of the future. The industry has played a major role in addressing pressing global health crises; developing vaccines and treatments which work towards the eradication of diseases such as polio and smallpox. Voluntary participation in eradication schemes such as the London Declaration on Neglected Tropical Diseases,<sup>76</sup> and drug-access initiatives such as the Medicines Patent Pool,<sup>77</sup> and COVAX<sup>78</sup> demonstrate a capacity and potential willingness to contribute towards the fulfilment of health-rights to the benefit of both current and future generations.

Nevertheless, despite the importance of the pharmaceutical industry to the fulfilment of human rights for both current and future generations, they may also cause significant harm to rights-holders. For example, the environmental sustainability of the pharmaceutical industry has come into sharp focus.<sup>79</sup> Pollution is the leading cause of mortality worldwide,<sup>80</sup> and pharmaceutical production is a major source of healthcare-based greenhouse gas (GHG) emissions and pollution.<sup>81</sup> In Canada, pharmaceuticals account for 25% of healthcare-based GHG emissions.<sup>82</sup> In Australia, it accounted for 19% of healthcare GHG emissions.<sup>83</sup> In the USA, prescription drugs alone account for 10% of the healthcare-based carbon footprint,<sup>84</sup> whilst pharmaceutical production produced 23% of the US healthcare-related ozone depleting pollutants.<sup>85</sup>

---

<sup>75</sup> ICESCR, Article 15(1)(b); CESCR, General Comment 25 supra n 32 at para 67.

<sup>76</sup> London Declaration on Neglected Tropical Diseases (2012) [https://assets.publishing.service.gov.uk/media/5a7563e2e5274a467f7e4262/NTD\\_20Event\\_20-20London\\_20Declaration\\_20on\\_20NTDs.pdf](https://assets.publishing.service.gov.uk/media/5a7563e2e5274a467f7e4262/NTD_20Event_20-20London_20Declaration_20on_20NTDs.pdf) (GOV.UK, accessed 26.06.2025).

<sup>77</sup> Medicines Patent Pool, <https://medicinespatentpool.org/> (MPP, accessed 26.06.2025).

<sup>78</sup> Markus Scholz and others, 'Public Health and Political Corporate Social Responsibility: Pharmaceutical Company Engagement in COVAX' (2023) 63 *Business & Society* 813

<sup>79</sup> Matilde Milanese, Andrea Runfola and Simone Guercini, 'Pharmaceutical industry riding the wave of sustainability: Review and opportunities for future research' (2020) 261 *Journal of Cleaner Production* 1.

<sup>80</sup> Jodi D. Sherman and others, 'The Green Print: Advancement of Environmental Sustainability in Healthcare' (2020) 161 *Resources, Conservation and Recycling* 2, 2.

<sup>81</sup> *Ibid*; M. J. Eckelman and J. Sherman, 'Environmental Impacts of the U.S. Health Care System and Effects on Public Health' (2016) 11 *PLoS One* e0157014, at 7.

<sup>82</sup> M. J. Eckelman, J. D. Sherman and A. J. MacNeill, 'Life cycle environmental emissions and health damages from the Canadian healthcare system: An economic-environmental-epidemiological analysis' (2018) 15 *PLoS Med* e1002623 at 7.

<sup>83</sup> A. Malik and others, 'The carbon footprint of Australian health care' (2018) 2 *Lancet Planet Health* e27, e32.

<sup>84</sup> Eckelman and Sherman, supra n 81 at 4.

<sup>85</sup> *ibid*, 7.

Pharmaceuticals enter the environment through manufacture, patient excretion and disposal of unused or expired medicines.<sup>86</sup> The physiochemical composition of many medicines and pharmaceutical products remains persistent within the environment, long after initial use, with their non-degradation leading to growing levels of pollution and toxins in water, food and the air, damaging ecosystems, as well as animal and human health.<sup>87</sup> For example, growing levels antibiotics in water systems has led to increasing resistance from harmful organisms such as salmonella and staphylococcus.<sup>88</sup> Scientists have also begun to identify rising levels of endocrine disruptors in aquatic ecosystems, which have the potential to impact hormone production in marine life, with significant implications for their capacity for reproduction.<sup>89</sup>

While environmental concerns are pressing, equally important are the socio-economic and developmental impacts of the industry, including exclusionary strategies relating to innovation, distribution and pricing. Evidence exists of a structural neglect of health crises which impact low-middle income nations. The Global Forum for Health Research have expressed this deficiency through the '10/90 gap', whereby less than 10% of global health research is invested into considering health problems which amount to 90% of the global health burden.<sup>90</sup> The pharmaceutical industry, as priority-setter in clinical research has a core role to play in correcting the disproportionate investment of resources which have the capacity to perpetrate cycles of intergenerational inequity in low-income and underserved communities.

The economic impact of corporate decision-making in the healthcare sector may also have negative implications for the rights of future generations. The pricing practices of pharmaceutical companies, where drugs are priced beyond the level of individual affordability can continue to perpetual cycles of poverty and inequality.<sup>91</sup> Pharmaceutical companies have the capacity, through their pricing decisions to restrict access, to the detriment of not only present, but future generations.

---

<sup>86</sup> David Taylor, 'The Pharmaceutical Industry and the Future of Drug Development' in R E Hester and R M Harrison (eds), *Pharmaceuticals in the Environment*, (Royal Society of Chemistry 2015) , 7.

<sup>87</sup> Jhon F Narvaez and Claudio Jimenez, 'Pharmaceutical Products in the Environment: Sources, Effects and Risks' (2012) 19 *Journal Vitae* 93.

<sup>88</sup> *Ibid*, 97.

<sup>89</sup> *Ibid*, 99.

<sup>90</sup> Global Forum for Health Research and World Health Organization, *The 10/90 (ten ninety) report on health research 2003-2004*, 2004); J. Millum, 'Ethics and health research priority setting: a narrative review' (2024) 9 *Wellcome Open Res* 203.

<sup>91</sup> Klaus M Leisinger, 'Poverty, Disease and Medicines in Low- and Middle-Income Countries: The Role and Responsibilities of Pharmaceutical Corporations' (2012) 31 *Business and Professional Ethics Journal* 135, 137.

Whilst certainly not the only industry with a significant duality of both potential rights fulfilment and infringement, Pharmaceutical Companies play an extraordinarily important role in society, researching, developing and distributing critical, essential medicines, necessary for the very survival of humankind. This was made starkly apparent after the global COVID-19 crisis, where the industry's response was critical in the global effort to develop and distribute effective vaccinations. This integral societal function has led Hunt and Lee to recognise the industry as an arguably distinct case under international human rights law, requiring the attribution of positive responsibilities.<sup>92</sup> In light of this, examining both the positive and negative impacts of the pharmaceutical industry on the rights of future generations and environment is critical to understand how the conduct of states and the industry itself can better protect and fulfil the human rights of future generations, without unduly harming those of current generations.<sup>93</sup> How such action might manifest shall be considered in section 5 below in line with The Principles, and their implications for the key functions of the pharmaceutical industry. I shall begin by looking at general measures which are required under The Principles, before examining their wider implications for the specific areas of 'Research and Development of New Medicines', and the 'Production of Medicines'.

#### 4.2. General Duties of Pharmaceutical Companies Towards Future Generations

##### 4.2.1. *Policy Commitments towards the Rights of Future Generations*

Principle 25 makes clear that Corporations have a duty to respect the rights of future generations. Within this duty is the requirement to make policy commitments towards the right of future generations.<sup>94</sup> Existing industry commitments may fall within the purview of Principle 25. The Royal Pharmaceutical Society (UK) has explicitly recognised the importance of sustainability and environmental protections, with a clear policy commitment towards removing environmental harms.<sup>95</sup> Similar policy commitments to environmental sustainability and decarbonisation come from a number of leading pharmaceutical companies, such as Johnson and Johnson,<sup>96</sup> Glaxo-

---

<sup>92</sup> Lee and Hunt, 'Human Rights Responsibilities of Pharmaceutical Companies in Relation to Access to Medicines', 228.

<sup>93</sup> See: The Principles, supra n 1, Principle 7(c), at 6.

<sup>94</sup> *ibid*, Principles 25(b)

<sup>95</sup> Royal Pharmaceutical Society, 'Pharmacy's Role in Climate Action and Sustainable Healthcare' (RPS, 101) <https://www.rpharms.com/recognition/all-our-campaigns/policy-a-z/pharmacys-role-in-climate-action-and-sustainable-healthcare#introduction> (accessed 10<sup>th</sup> December 2024).

<sup>96</sup> Johnson & Johnson, 'Global environmental sustainability' (J&J, 2024) <https://www.jnj.com/our-societal-impact/global-environmental-sustainability> (accessed 10<sup>th</sup> December 2024).

Smith-Klein,<sup>97</sup> and Pfizer.<sup>98</sup> These commitments signal a recognition within policy of the importance of sustainability, which is itself necessary for the protection of the rights of future generations and the environment. Nevertheless, they do not explicitly recognise future generations or their rights as part of their commitment to sustainability and therefore do not currently align fully with the expectations set out in The Principles. The absence of reference to future generations is not unexpected given the relative novelty of the concept within policy and legal discourse. With the advent of The Principles, it is hoped that greater focus upon intergenerational issues will lead to further recognition of the rights of future generations will become evident within corporate and industry policy commitments.

Nevertheless, one must be critical of policy commitments alone, absent any formal mechanism of accountability. It is a fruitless exercise to engage corporations with policy commitments whilst not ensuring that any such commitments are respected. Evidence from other non-binding policy initiatives, such as the UN Global Compact, show that whilst corporations are often happy to acknowledge the need for respecting human rights, their actual business practices show limited change.<sup>99</sup> More concrete regulatory approaches, with greater binding effect (be they legal or societal) may therefore be required to ensure compliance with and respect for the rights of future generations.

#### 4.2.2. *Due Diligence for Future Generations*

Perhaps with an understanding of deficiencies in policy commitments, The Principles go further to require human rights due diligence which accounts for the rights of future generations.<sup>100</sup> The Principles explicitly require that businesses ‘refrain from causing or contributing to adverse impacts... [to] human rights through their activities... and prevent harm, mitigate risk and remedy such impacts where they occur.’<sup>101</sup> This amounts to a requirement, not only to refrain from harm, but also to *prevent* harm (discussed in further detail below).

Human Rights due diligence is a firmly established component of the relationship between business and human rights, enshrined most prominently in soft law instruments such as the UN

---

<sup>97</sup> Glaxo-Smith-Klein, ‘Environment: Our sustainability goals and targets’ (GSK, 2024) <https://www.gsk.com/en-gb/responsibility/environment/> (accessed 10<sup>th</sup> December 2024).

<sup>98</sup> Pfizer, ‘Environmental Sustainability’ (Pfizer, 2024) <https://www.pfizer.com/about/responsibility/environmental-sustainability> (accessed 10<sup>th</sup> December 2024).

<sup>99</sup> S. Prakash Sethi and Donald H. Schepers, ‘United Nations Global Compact: The Promise–Performance Gap’ (2013) 122 *Journal of Business Ethics* 193, 199.

<sup>100</sup> The Principles, *supra* n1, Principles 25.

<sup>101</sup> *Ibid*, Principle 25(a).

Guiding Principles on Business and Human Rights<sup>102</sup> and the OECD Guidelines for Multinational Enterprises on Responsible Business Conduct.<sup>103</sup> In short, human rights due diligence requires corporations to consider potential and actual interferences with human rights within their processes, practices and supply chains. The Principles, extend human rights due diligence, for the first time, towards future generations. Doing so is a logical extension of the temporal universality which underpins their core argument for the application of human rights to future generations. That is, all human rights apply to future generations and therefore any comprehensive regime of corporate human rights due diligence must necessarily include future generations. As shall be explored below, there are significant practical challenges posed to the implementation of due diligence mechanisms which require an inherently speculative or predictive element. The non-existence of those whose rights are to be protected creates a broad spectre of potential rights-holders who should be considered, alongside the equally unknown number of potential negative outcomes which might arise from the vast array of potential activities which might be undertaken by a business within their operations. In light of this, further research is required to fully understand what human rights due diligence for future generations might look like in policy and in practice. In the following sections, I seek to explore expectations of conduct implicit within The Principles, for the pharmaceutical industry, which might form some of the substantive content of any such due diligence process. However, structural and theoretical aspects will necessarily require further development and testing through implementation within international law and corporate structures.

It is not entirely clear how due diligence for future generations (DDFG) might operate in practice. The conceptual challenges to an operational model for DDFG include significant issues of predictability. In essence, how can we be sure if an action has the potential to interfere with the rights of future generations? Overcoming such a hurdle may be more straightforward in some contexts than others. For example, environmental harm, such as pollution or significant greenhouse gas emissions, could arguably constitute harm which directly impacts the human rights of future generations in several ways, including (inter alia) the right to a healthy environment, the right to health, and the right to life. Such harm is foreseeable, supported by clear

---

<sup>102</sup> UNGA, 'Guiding Principles on Business and Human Rights: Implementing the United Nations Protect, Respect, Remedy Framework' (2011) UN Doc. HR/PUB/11/04.

<sup>103</sup> OECD, 'Guidelines for Multinational Enterprises on Responsible Business Conduct' (OECD, 2023) [https://www.oecd.org/en/publications/2023/06/oecd-guidelines-for-multinational-enterprises-on-responsible-business-conduct\\_a0b49990.html](https://www.oecd.org/en/publications/2023/06/oecd-guidelines-for-multinational-enterprises-on-responsible-business-conduct_a0b49990.html) (accessed 10th December 2024).

scientific evidence of environmental damage. Any model of due diligence for future generations should thus be capable of integrating consideration of climate impact.

Perhaps more challenging, however, are harms with a lower level of predictability or causal clarity. Drawing a direct line between, for example, current business practices, and the capacity for future generations to benefit from scientific developments is more complex. Restrictive practices, such as the use of intellectual property protections and market control pose significant issues of access to medicines for current generations,<sup>104</sup> but it does not necessarily follow that this may cause harm to future generations. Nevertheless, a more open a collaborative environment for scientific innovation shows promise for meeting the healthcare needs of the future (discussed in more detail below in section 5.2.1). Cognisance of such practices may thus *benefit* future generations, yet its absence may be more difficult to conceptualise as a prospective *harm*, necessitating prevention through due diligence. Given this ambiguity, how DDFG is to be developed in policy and practice represents an important area for further research, both generally and in the context of specific industries.

The second aspect outlined by The Principles is the need for businesses to *prevent* harm to the rights of future generations.<sup>105</sup> This is an interesting development as it arguably goes further than traditional conceptions of due diligence, which generally only ask companies to refrain from harm.<sup>106</sup> The notion of preventing harm supposes positive measures to actively protect human rights, rather than only to respect them. To this end, Hunt and Lee have argued for such an extension into the realm of positive rights protection for pharmaceutical companies in the context of access to medicines.<sup>107</sup> This, they argue, stems from an integral public function served by the pharmaceutical industry, which necessitates the attribution of responsibilities beyond respect.<sup>108</sup> This has not gone without criticism, primarily relating to the potential diminishment of the role of the state.<sup>109</sup> It is beyond the scope of this paper to enter into the debate surrounding the attribution of legal responsibilities to non-state actors, nor the implications for state responsibilities. Nevertheless, The Principles are taking a bold step into realms beyond settled

---

<sup>104</sup> Ellen 't Hoen, *Private Patents and Public Health: Changing Intellectual Property Rules for Access to Medicines*, (Health Action International 2016).

<sup>105</sup> The Principles, supra n 1, Principle 25(a).

<sup>106</sup> This is certainly the position taken by John Ruggie and the UNGPS.

<sup>107</sup> Lee and Hunt, supra n 72 at 228.

<sup>108</sup> *Ibid.*

<sup>109</sup> See for example: Emmanuel Oke, 'Defining the right to health responsibilities of patent-owning pharmaceutical companies' (2019) 1 *Intellectual Property Quarterly* 43, and Suerie Moon, 'Respecting the Right to Access Medicines: Implications of the UN Guiding Principles on Business and Human Rights for the Pharmaceutical Industry' (2013) 15 *Health and Human Rights* 32.

international law. Indeed, it is only recently that arguments around a state obligation to prevent have emerged, either as part of the obligation to protect, or as an independent obligation.<sup>110</sup> Application to non-state actors such as corporations is therefore a significant step forward into the unknown. Such steps, where necessary in context, may be borne out by corporate practice, where due diligence measures for future generations are implemented. Indeed, regardless of academic debate, the proof of the viability of this extended conception of human rights due diligence will be in the capacity and willingness of corporations to undertake them, and for states to enforce them.

Having outlined the basic relevance and applicability of The Principles for corporations more broadly, I now seek to explore the implications and importance of The Principles for Pharmaceutical Companies in particular. As my starting point, I break down the key areas within the pharmaceutical business model to exam the core points of interaction with The Principles. These are: (a) the research and development of novel medicines, and (b) the production of medicines.

### 4.3. Research and Development of New Medicines

#### 4.3.1. *Intellectual Property and Collaborative Development*

The current global intellectual property (IP) regime poses significant challenges for access to medicines for current generations.<sup>111</sup> The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)<sup>112</sup> places significant restrictions on the capacity for states to establish intellectual property regimes which provide unimpeded access to essential medicines. Against this backdrop, the former Special Rapporteur on the Right to Health, Anand Grover, has gone as far as to argue that the right to health demands that ‘essential’ medicines should not be patented.<sup>113</sup> In addition, IP protectionism within the process of research and development arguably slows the pace of pharmaceutical advancements critical for tackling the healthcare needs of future generations. Nevertheless, such protectionism remains central to the current model of profit-driven pharmaceutical development. A tension thus exists between profit-

---

<sup>110</sup> Sigrun I. Skogly, 'Prevention is Better than a Cure: The Obligation to Prevent Human Rights Violations' (2024) 46 Human Rights Quarterly 330.

<sup>111</sup> Hoen, *supra* n 104.

<sup>112</sup> Agreement on Trade-Related Aspects of Intellectual Property Rights (Annex C of the Marrakesh Agreement Establishing the World Trade Organisation, signed in Marrakesh, Morocco on 15<sup>th</sup> April 1994).

<sup>113</sup> UNHRC, 'Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health, Anand Grover' (16<sup>th</sup> March 2021) UN Doc. A/HRC/17/43, para 36.

protection and rights protection, not only in accessing medicines for current generations, but the development of medicines for future generations.

As one of the key functions of the pharmaceutical industry, the research and development of new medicines is a key area implicating both rights infringement and fulfilment. The process and outcomes of research and development holds relevance for the right to health and the right to benefit from scientific development. The Principles make clear that future generations are legally entitled to all internationally recognised human rights.<sup>114</sup> It follows that future generations are legally entitled to the right to benefit from scientific progress and its applications, espoused in Article 15(1)(b) of ICESCR and Article 27 of the Universal Declaration on Human Rights (UDHR). The right to science applies broadly to all areas of scientific development,<sup>115</sup> therefore encompassing developments in pharmaceutical medicines and technologies. The right to science, includes a right to access scientific knowledge,<sup>116</sup> including where this requires the limitation of IP rights.<sup>117</sup> Taken in combination with Weiss's notion of conservation of access,<sup>118</sup> it is arguable that pharmaceutical companies should make their research and development accessible in a manner which allows it to be continually developed and improved upon and accessed by future generations.

Such a position holds significant implications for both current and future intellectual property regimes and the way the pharmaceutical industry operates. Indeed, arguably the very foundation of the modern pharmaceutical industry is its capacity to protect and profit from its products. Significantly, beyond providing value to shareholders, it is often argued by the industry that these profits provide a financial basis for reinvestment into the research and development of new medical technologies.<sup>119</sup> From such a perspective, any detriment to profits is an equal detriment to research and development. Whether this is truly the case is a point of contestation.<sup>120</sup> Nevertheless, the extent to which rates of medical innovation is upheld may have significant implications from a human rights perspective. The health of future generations may rely, in part, on the willingness and capacity of current pharmaceutical companies to develop novel

---

<sup>114</sup> The Principles, supra n 1, Principle 2.1(a) at 4.

<sup>115</sup> UNESCO, 'Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications' (16<sup>th</sup> July 2009) (The Venice Statement).

<sup>116</sup> UNHRC, 'Report of the Special Rapporteur in the field of cultural rights, Farida Saheed on the right to enjoy the benefits of scientific progress and its applications' (14<sup>th</sup> May 2012) UN Doc. A/HRC/20/26, para 26.

<sup>117</sup> *ibid*, paras 57 and 72.

<sup>118</sup> Weiss, supra n 19 at 22-23.

<sup>119</sup> A. Angelis and others, 'High drug prices are not justified by industry's spending on research and development' (2023) 380 *BMJ* e071710.

<sup>120</sup> *Ibid*.

medicines which address emergent healthcare needs. Any process (including those aimed at *protecting* human rights) which deter future research, must be seen as potentially harmful. Policymakers must therefore be cognisant of the market impacts of policies, even those aimed at protecting rights.

Nevertheless, much can be said of reforming the way in which medical research and development is conducted within the pharmaceutical industry, including its relationship with intellectual property. R&D rates have decreased significantly over the last decades, attributed in part to the growing complexity of remaining biological pathologies, since more simplistic challenges have already been addressed.<sup>121</sup> Stringent intellectual property laws may also impact innovation. The picture is complex and multifaceted and requires significant attention from scholars, policymakers, and corporations. A significant number of studies demonstrate a statistically significant *positive* relationship between IP protections and innovation.<sup>122</sup> That is, that greater patent protection fostered greater innovation. However, there are also a significant number of studies which demonstrate a *negative* relationship, specifically in low/medium income or developing countries.<sup>123</sup> It cannot be said therefore that intellectual property protections are ‘bad’ for innovation. Indeed, in many cases, IP protection represents a core facilitator and incentive for innovation to create medicines to meet the healthcare needs of current and future generations. Nevertheless, this is not the case in all countries or systems. The negative impact on the capacity for developing nations to innovate represents a significant challenge for the protection of the right to health for current and future generations. It is therefore critical for the pharmaceutical industry and states to adapt, potentially adopting new methods of working to meet the healthcare needs of the future, taking account of the socio-economic context within which they operate.

Amongst the most promising suggestions for new modes of development are those which focus upon collaboration. Novel technologies, shared amongst competitors, and developed in a collaborative manner, holds the potential to significantly accelerate the rate of development.<sup>124</sup> This form of ‘Open Innovation’ can accelerate the speed a drug reaches the market. This is particularly important when responding to urgent health crisis, such as COVID-19, where a more

---

<sup>121</sup> Franco Malerba and Luigi Orsenigo, 'The evolution of the pharmaceutical industry' (2015) 57 Business History 664, 678.

<sup>122</sup> Saina Baby and K. C. Adaina, 'Examining the Impact of TRIPS Agreement on Innovation: A Review and Research Agenda' (2022) Journal of Interdisciplinary Economics 1

<sup>123</sup> Ibid

<sup>124</sup> A. Schuhmacher and others, 'Models for open innovation in the pharmaceutical industry' (2013) 18 Drug Discov Today 1133

collaborative approach to development led to the creation of vaccines in an unprecedented timeframe,<sup>125</sup> acting as “a catalyst for transformative collaboration”.<sup>126</sup> Indeed, such a model has taken root significantly within research-focused pharmaceutical companies,<sup>127</sup> with the sector seen to be promoting the model’s use beyond comparable technological fields.<sup>128</sup>

A more general shift towards this collaborative (rather than competitive) mode of operations represents a significant opportunity for the pharmaceutical industry to respond to the healthcare needs of the future in a dynamic and prompt manner, respecting and fulfilling the human rights of future generations. At the same time, both corporations and states must be cognisant of the need to retain positive relations between IP regulation and innovation. How such approaches can be balanced, to serve the needs of both current and future generations requires careful consideration by policymakers and the pharmaceutical industry, working in collaboration.

#### 4.3.2. *A Duty to Develop?*

A further question is whether the rights of future generations impose a duty on the pharmaceutical industry to develop new medicines? States have an obligation to develop medicines to meet the health needs of current generations. Following the concept of temporal universality, this should extend to future generations as well. To this end, The Principles make clear that ‘states must take all necessary measures to fulfil the human rights of future generations’<sup>129</sup> including creating ‘an enabling environment to prevent and remove the causes of asymmetries and inequalities between and within states’.<sup>130</sup> Given the high levels of health inequalities, in particular related to access to medicines and medical treatment, focus upon ensuring a reduction in health inequalities for future generations should be a priority.

The Principles make clear that a ‘failure to take appropriate measures to prevent potential public health emergencies in the future’<sup>131</sup> constitutes a violation of the obligation to fulfil the human rights of future generations for States. Such measures might include ensuring that sufficient research and development is put into treatment for diseases and conditions which hold the

---

<sup>125</sup> Wellcome Trust, ‘How have Covid-19 vaccines been made so quickly?’ (Wellcome Trust, 2021) <https://wellcome.org/news/quick-safe-covid-vaccine-development> accessed 10th December 2024.

<sup>126</sup> A. Schuhmacher and others, ‘Open innovation: A paradigm shift in pharma R&D?’ (2022) 27 Drug Discov Today 2395, 2403.

<sup>127</sup> Ibid.

<sup>128</sup> A. W. K. Yeung and others, ‘Open Innovation in Medical and Pharmaceutical Research: A Literature Landscape Analysis’ (2020) 11 Front Pharmacol 587526.

<sup>129</sup> The Principles, supra n 1, Principle 20(a) at 12

<sup>130</sup> ibid, Principle 20(b), at 12.

<sup>131</sup> ibid, Principles 21(i), at 14.

potential to cause public health emergencies. Former Special Rapporteur in the field of cultural rights, Farida Shaheed, similarly notes that developed nations have an obligation to develop ‘international collaborative models of research and development for the benefit of developing countries and their populations’.<sup>132</sup> Arguably, this translates to an obligation for states to develop new health technologies and treatments which meet the healthcare needs of future generations. Such a position finds further support from the right to health. As former Special Rapporteur on the Right to Health, Paul Hunt, has argued, the right to health “not only requires that existing medicines are accessible, but also that much-needed new medicines are developed as soon as possible...”<sup>133</sup> Under this interpretation of the right to health, States must ensure that medicines demanded by the healthcare needs of the population are developed to meet those needs. This obligation is made clear in times of crisis. In response to the COVID-19 pandemic, the CESCR stated that:

‘It is imperative that States parties adopt appropriate regulatory measures to ensure that health-care resources in both the public and the private sectors are mobilized and shared among the whole population to ensure a comprehensive, coordinated health-care response to the crisis.’<sup>134</sup>

The also noted that:

‘...in the aftermath of the pandemic, scientific research should be promoted to learn lessons and increase preparedness for possible pandemics in the future.’<sup>135</sup>

On this basis, it could thus be argued strongly that states have an obligation to ensure that scientific research, including the development of pharmaceuticals, is undertaken to respond to healthcare needs. Given the dominance of the private sector in pharmaceutical development, for states to fulfil this aspect of the rights of future generations, pharmaceutical companies will have to play a key role. As the Venice Statement on the Right to Enjoy the Benefits of Scientific Progress and its Applications (Venice Statement) notes:

---

<sup>132</sup> UNHRC, supra n 116 at para 68.

<sup>133</sup> UNGA, ‘Report of the Special Rapporteur on the Right of Everyone to the Enjoyment of the Highest Attainable Standard of Physical and Mental Health’ (11<sup>th</sup> August 2008) UN Doc. A/63/263, Principle 8 at 18. This is echoed by Special Rapporteur Anand Grover in UNGA, ‘Report of the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health’ (16<sup>th</sup> March 2011) UN Doc. A/HRC/17/43, para 46.

<sup>134</sup> CESCR, ‘Statement on the coronavirus disease (COVID-19) pandemic and economic, social and cultural rights’ (17<sup>th</sup> April 2020) UN Doc. E/C.12/2020/1, para 13.

<sup>135</sup> Ibid, para 23

‘The relationship between human rights and science is further complicated by the fact that private and non-State actors are increasingly the principal producers of scientific progress and technological advances. It is the responsibility of States to ensure that all relevant interests are balanced, in the advance of scientific progress, in accordance with human rights.’<sup>136</sup>

Clearly, states have a responsibility to ensure that the private sector not only respects human rights, but also, where private sector involvement is significant, that it functions appropriately to advance scientific progress and fulfil human rights. States must ensure that pharmaceutical companies prioritise research which develops medicines targeted at meeting the future generation’s health needs, alongside present generations. Such a position is further strengthened by soft law guidance for the pharmaceutical industry. The Guidelines for Pharmaceutical Companies Regarding Access to Medicines,<sup>137</sup> compiled by the former Special Rapporteur on the Right to Health, Paul Hunt, note that:

“The company should engage constructively with key international and other initiatives that are searching for new, sustainable and effective approaches to accelerate and enhance research and development for neglected diseases.”<sup>138</sup>

They note that this is particularly critical for neglected diseases which impact some of the most vulnerable people globally.<sup>139</sup> The Guidelines clearly support a more open approach to development (as explored above) and signal the clear need for cognisance of the health needs of future generations. Whilst these guidelines are not binding law, together with the moral imperative towards future generations, such a statement represents a clearly justified line of argument towards the development of stronger standards for the pharmaceutical industry to take account of future generations and future health needs within their research and development.

Arguably, a strong case exists for a duty to develop medicines, for current generations, in response to pressing healthcare challenges such as pandemics, and indeed, for future generations. Nevertheless, clear practical challenges exist for fulfilling such a duty to develop in line with the needs of future generations. Firstly, how can we ascertain what the medical needs of the future will be? The Hunt Guideline’s focus on currently neglected diseases offers one approach. These diseases which impact some of the world’s most vulnerable populations have

---

<sup>136</sup> Venice Statement, supra n 115 at para.5.

<sup>137</sup> UNGA, supra n 133.

<sup>138</sup> *ibid*, Principle 25 at 21.

<sup>139</sup> *ibid*, Principle 23 at 20.

the potential to perpetuate cycles of intergenerational injustice. Their treatment should therefore be a priority. Similarly, conditions which may transmit from mother to child are also conditions which may be significant for protecting the right of future generations. Intergenerational HIV transmission, for example, arguably poses a threat to the right to health for future generations. Nevertheless, other cases may be more challenging.

Predictive modelling may also provide some capacity for predicting future healthcare needs. Models utilising large datasets, AI and machine learning, offer opportunities for both states and companies to steer research towards likely future healthcare needs.<sup>140</sup> However, whilst models predicting future healthcare challenges may provide some insight, ultimately, it may not be possible to correctly identify all future healthcare needs. A duty to develop therefore will always be a challenge to fully comply with.

A pertinent question to consider, is whether we should presuppose which medical needs should be prioritised when considering future generations. As Weiss argues, intergenerational justice demands that we work to conserve opportunities and options for future generations.<sup>141</sup> That is, to facilitate an environment which provides future generations with the opportunities to make their own decisions and set their own priorities, not constrained or dictated by current generations. A tension thus exists between calculating and tackling healthcare needs which might arise in the future such that the rights of future generations are not infringed, whilst also being cognizant of the need not to constrain the options of future generations<sup>142</sup> or presuppose the nature of their values<sup>143</sup> or healthcare priorities. Such a consideration ties in directly with those practical difficulties in determining the healthcare needs of future generations.

Regardless, it is clear that the research and development of new medicines are critical components of meeting the health needs of both present and future generations. In addition, once medicines have been developed and demonstrate capacity to remedy ill health, their sustained production and dissemination becomes of equal concern – including for future generations. As such, I shall consider the production of medicines in the following section.

---

<sup>140</sup> See for example: H. J. Han and H. S. Suh, 'Predicting Unmet Healthcare Needs in Post-Disaster: A Machine Learning Approach' (2023) 20 *Int J Environ Res Public Health* 1; Djihane Houfani and others, 'Artificial intelligence in healthcare: a review on predicting clinical needs' (2021) 15 *International Journal of Healthcare Management* 267.

<sup>141</sup> Weiss, *supra* n 19 at 23.

<sup>142</sup> *Ibid.*

<sup>143</sup> *Ibid.*

#### 4.4. The Production of Medicines

The Principles make clear in their Preamble the need to end ‘unsustainable patterns of production’<sup>144</sup> and to decouple from ‘the destruction of Nature and the overconsumption of natural resources to achieve the realization of the human rights of present and future generations and the integrity of nature and natural systems.’<sup>145</sup> These statements culminate in Principle 7(c) which states:

‘To meet their obligations to future generations, States must necessarily impose reasonable restrictions on activities that undermine the rights of future generations, including the unsustainable use of natural resources and the destruction of Nature.’<sup>146</sup>

It is therefore clear that The Principles conceive of the reduction in the use of natural resources, environmental pollution and degradation of the natural environment within the production of products and services, necessarily including pharmaceuticals. This is supported by developments on the right to a clean, healthy and sustainable environment, which itself extends responsibilities to businesses.<sup>147</sup>

The production of medicines must therefore be considered in light of The Principles to understand how they propose to implicate changes to pharmaceutical production. In the following sections I will consider those two aspects highlighted by The Principles. Firstly, the environmental pollution caused by pharmaceutical production and the resultant need for ‘greener’ production, and secondly, the use of natural resources by pharmaceutical production.

##### 4.4.1. *The Pharmaceutical Industry and the Challenge of ‘Greener’ Production*

The Pharmaceutical Industry serves a core societal function through the production of essential medicines. Pharmaceutical companies which produce ‘generic’ products (unbranded medicines without patent protection) are particularly critical for meeting the healthcare needs of low-income nations, particularly those in the global south.<sup>148</sup> Indeed, the majority of those medicines

---

<sup>144</sup> The Principles, supra n 1, Preamble, Point XV, at 5.

<sup>145</sup> Ibid.

<sup>146</sup> Ibid, Principle 7(c).

<sup>147</sup> UNHRC, ‘Report of the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment, David R Boyd: Business, planetary boundaries, and the right to a clean, healthy and sustainable environment’ (2<sup>nd</sup> January 2024) UN Doc. A/HRC/55/43, para 16.

<sup>148</sup> M N G Dukes, *The Law and Ethics of the Pharmaceutical Industry*, (Elsevier Science and Technology 2005), 13.

considered 'essential' by the World Health Organization (WHO) are generic medicines.<sup>149</sup> These medicines are often made at scale, and free of patents, and are often produced and sold far more cheaply than their branded counterparts. These factors make generic medicines an essential tool, both practically and economically for the maintenance of the global supply of medicines, particularly for low- and middle-income countries.<sup>150</sup>

One method of maintaining these lower prices however is the bulk importation of chemical products used for production. These are often imported from chemical producing nations such as China.<sup>151</sup> Environmental damage resulting from such production, alongside issues surrounding working conditions and rights are therefore factors which must be considered. As Chen and Reniers discovered in their study of the Chinese chemical industry:

'Chemical Companies [in China] always expect to pursue short-term economic benefits and ignore work safety, resulting in fatalities and large economic losses, and discouraging sustainable development'.<sup>152</sup>

Indeed, chemical production, which forms a core aspect of pharmaceutical production, poses a significant threat to both environmental and human health on a global scale.<sup>153</sup> Poor wastewater management by bulk drug manufacturers has been shown to cause significant contamination of water with pharmaceutical products which has led to the spread of antimicrobial resistant pathogens.<sup>154</sup> Production-related environmental damage is more acute than consumption-related, as it isn't mitigated by dosage control or human metabolization.<sup>155</sup> Extant harms from pollution include impact on fertility, brain function and food production and supply.<sup>156</sup> The prospective negative impact on the capacity to provide and protect the rights of future generations is therefore existential.

---

<sup>149</sup> WHO, 'Model List of Essential Medicines 2023' (28<sup>th</sup> April 2023) WHO/MHP/HPS/EML/2023.02.

<sup>150</sup> Cindy Bors and others, 'Improving Access to Medicines in Low-Income Countries: A Review of Mechanisms' (2015) 18 *The Journal of World Intellectual Property* 1, 9.

<sup>151</sup> Dukes, *supra* n 148 at 13.

<sup>152</sup> Chao Chen and Genserik Reniers, 'Chemical industry in China: The current status, safety problems, and pathways for future sustainable development' (2020) 128 *Safety Science* 1, 12.

<sup>153</sup> R. Naidu and others, 'Chemical pollution: A growing peril and potential catastrophic risk to humanity' (2021) 156 *Environ Int* 106616

<sup>154</sup> C. Lubbert and others, 'Environmental pollution with antimicrobial agents from bulk drug manufacturing industries in Hyderabad, South India, is associated with dissemination of extended-spectrum beta-lactamase and carbapenemase-producing pathogens' (2017) 45 *Infection* 479

<sup>155</sup> D. G. Larsson, 'Pollution from drug manufacturing: review and perspectives' (2014) 369 *Philosophical Transactions of the Royal Society B* 1

<sup>156</sup> Naidu et al, *supra* n 153.

Nevertheless, as noted, it is often those in low-income nations who rely most on affordable generic medicines. It is critical, therefore, to be cognizant of the needs of low-income populations to access affordable medicines, whilst also implementing measures to limit carbon emissions and pollution, which often stem from processes designed to reduce expenditure and thus resultant prices. The question therefore remains as to how sufficient, affordable medicines can continue to be produced to meet current and future healthcare demands, whilst minimising, or eliminating negative externalities which pose a threat to the lives and health of both current and future generations.

What then can be said of the implications of The Principles and this tension between the production of essential medicines and resultant environmental harm? A starting point would be to question whether such environmental and societal harm is a *necessary* pre-requisite to produce affordable essential medicines. From an economic perspective, the market price of medicines is bound to rise where environmental protection measures and novel development technologies are employed, given the additional costs these introduce into the line of production. Stemming from this, there is thus a relevant concern that greater respect for the environment may have adverse impacts on the right to health, in particular the right to access medicines. Nevertheless, as Larsson argues, given the concentration of production on relatively few sites, the installation of greener technological solutions and risk management systems may in fact be a moderate overall cost.<sup>157</sup> As they note, one solution is the use of interchangeable products within production which result in lower pollution levels,<sup>158</sup> although they do acknowledge the challenge of identifying which products are the source of pollution, such that they can be exchanged.<sup>159</sup> In addition, concerns about the right to health ought also to consider the threats to human health by pollution and climate change. Indeed, the right to health protects the “underlying determinants of health”,<sup>160</sup> which include (inter alia) the right to water, sanitation and a healthy environment. All of these may be negatively impacted by pollutants which arise from the pharmaceutical manufacturing process. Developing techniques and technologies to tackle such pollution is therefore a concern not only for environmental rights, but also for the right to health.

---

<sup>157</sup> Larsson, *supra* n 155 at 5.

<sup>158</sup> *ibid.* This step has also been suggested by Yannik Brems, Alexei Lapkin and Jan Baeyens, 'Pollution prevention in the pharmaceutical industry' (2013) 6 *International Journal of Sustainable Engineering* 344, 348.

<sup>159</sup> Larsson, *supra* n 155 at 5.

<sup>160</sup> ICESCR, article 12.

Technologically, a greener approach to pharmaceutical production is possible, including investment in better waste management and water filtration technologies<sup>161</sup> as well as solvent recycling and modifications to existing production processes.<sup>162</sup> To this end, Brems et al provide a clear overview of the methods which might be used to reduce the pollutant output of pharmaceutical producers, aimed at tackling waste production, as well as water and air pollution.<sup>163</sup> It is not the purpose of this paper to suggest specific measures, or to make judgments of their efficacy. It suffices to conclude here that reduction in environmental pollution and impacts in the pharmaceutical production process appear to be a technological possibility. Given this, the Pharmaceutical Industry should be working towards a ‘greener’ approach to production.

Yet, the pharmaceutical industry cannot be expected to (and likely will not) act solely on its own initiative. States must play a leading role, in line with their legal obligations toward future generations. As Larsson highlights:

‘...to ensure safe discharge levels from drug manufacturing, incentives to invest in and operate efficient wastewater technology are essential. The strongest incentives are economic, including legal obligations which can lead to fines or the withdrawal of operation permits.’<sup>164</sup>

Acknowledging the need for the pharmaceutical industry to adopt greener production policies, in line with The Principles, is a fruitless endeavour where there is no incentive, legal, economic, or otherwise for them to do so. Whilst the moral imperatives of The Principles are clear, they are not binding upon non-state actors. It is therefore incumbent upon States to work alongside the industry to ensure these outcomes.

Adjacent to the environmental responsibilities of corporations are responsibilities relating to disclosure of environmental impacts. Principle 23(c) also provides for a duty of States to “provide and disseminate information on matters that are important for the effective protection of human rights of future generations, such as environmental and climate-related information”.<sup>165</sup> This obligation can be directly linked to concurrent obligations under Article 15 ICESCR to receive

---

<sup>161</sup> Larsson, supra n 155 at 5.

<sup>162</sup> Brems, Lapkin and Baeyens, supra n 158 at 348.

<sup>163</sup> Ibid, 350.

<sup>164</sup> Larsson, supra n 155 at 5.

<sup>165</sup> The Principles, supra n 1, Principles 23(c), at 15.

information relating to the risks of scientific developments.<sup>166</sup> Such an obligation upon states may necessarily implicate the pharmaceutical industry. To fulfil this obligation, state may require companies, such as pharmaceutical companies, to collect and make public, information related to their environmental impacts. Such disclosures already form part of corporate regulations in several jurisdictions. In the UK, company directors must disclose the level of greenhouse gas emissions in their yearly ‘Director’s Reports’;<sup>167</sup> whilst in France, all financial institutions must disclose the environmental, climate and biodiversity risks of their investments.<sup>168</sup> Such disclosures are critical in industries which utilise large quantities of harmful chemicals within their processes, increasing the impact of their practices on future generations. In particular, the disposal of harmful pollutants, including the location of disposal sites, which may not be suitable for future use.

#### 4.4.2. *Pharmaceutical Production and the Sustainable Use of Natural Resources*

The Principles make clear that protection of the environment and rights of future generations also requires us to rethink our use of natural resources. They make clear that States, in their obligation to fulfil the rights of future generations, must phase out “unsustainable consumption and production patterns and waste production that jeopardizes the Earth’s ability to sustain future generations...”<sup>169</sup> Going further they argue that States must “...impose reasonable restrictions on activities that undermine the rights of future generations, including the unsustainable use of natural resources...”<sup>170</sup> Several questions result from such an argument:

1. Does the pharmaceutical industry engage in the unsustainable use of natural resources?
2. What ‘reasonable’ restrictions can be placed upon such usage, and what impact will this have on the rights of present generations?
3. Can such restrictions be legally and/or ethically justified?

Answering these questions fully will require extensive further research. However, I draw out some broad principles here.

---

<sup>166</sup> ICESCR, article 15; CESCR, General Comment No.25, supra n 32.

<sup>167</sup> Companies Act 2006 (Strategic Report and Directors’ Report) Regulations 2013 (UK); Companies (Directors’ Report) and Limited Liability Partnerships (Energy and Carbon Report) Regulations 2018 (UK).

<sup>168</sup> French Law on Energy and Climate 2019, Article 29 (Original Language Version: [https://www.legifrance.gouv.fr/jorf/article\\_jo/JORFARTI000039355992](https://www.legifrance.gouv.fr/jorf/article_jo/JORFARTI000039355992))

<sup>169</sup> The Principles, supra n 1, Principle 20(ix), at 13.

<sup>170</sup> Ibid, Principle 7(b), at 6.

In answering the first question, whilst attributing blame across the industry would be reductive, we can say that the data demonstrates that in many cases, the pharmaceutical industry uses significant amounts of natural resources, primarily derived from fossil fuels, in the development and production of medicines.<sup>171</sup> For climate protection, much of this is 'unsustainable', given the limited nature of the resource and the climate impacts in its extraction and use. Additionally, many natural resources used in the pharmaceutical industry risk the exploitation of low-income nations where the resources are often located.<sup>172</sup> These are not only unsustainable but also represent potential threats to the rights of current generations and risk the perpetuation of cycles of poverty which violate core tenant of intergenerational justice and the rights of future generations.

In light of the necessity of resource restrictions, we must also consider how to understand their reasonableness considering the rights of *present* generations. A reasonable restriction is arguably one which *limits* the harm caused to present generations *as far as possible*. Any restriction which unnecessarily limits the rights of present generations, going beyond what is absolutely necessary, arguably constitutes a human rights violation. Limitations must therefore be balanced against the necessity and urgency of averting harm to the environment and future generations and the level of harm which is likely to be suffered. The greater the threat to the rights of future generations, the greater the justification for restrictions upon current generations. In applying this balancing exercise to the case of medicines, it is impossible to provide a blanket approach, since different medicines have different ingredients, requiring differing extraction, refinement, development and production processes, each with their own idiosyncratic relationship with the environment and potential impacts on future generations.

A further issue for resource usage is the demands placed upon pharmaceutical manufacturers by the market. The over-prescription and use of medicines such as antibiotics has been well documented, including the resultant concerns around resistance, bacterial mutation and environmental pollution. This overuse is often systemic and societal in nature.<sup>173</sup> Such overuse may also result in resource depletion, yet arguably the pharmaceutical industry is responding to the demands of the market, healthcare professionals and patients. It is not possible to provide a broad answer to this issue, as it will differ greatly depending on context and the medicine in

---

<sup>171</sup> Lea Wollensack, Kristi Budzinski and Jan Backmann, 'Defossilization of pharmaceutical manufacturing' (2022) 33 Current Opinion in Green and Sustainable Chemistry 1.

<sup>172</sup> Shayana Kadidal, 'Plants, poverty and pharmaceutical patents' (1993) 103 Yale Law Journal 223

<sup>173</sup> M. Hensher and others, 'Health care, overconsumption and uneconomic growth: A conceptual framework' (2020) 266 Soc Sci Med 113420

question. Nevertheless, it demonstrates that tackling overuse of natural resource by the pharmaceutical industry requires collaboration, coordination and change from other actors, including doctors, civil society and policymakers.

#### 4.4.3. *A Duty to Maintain Production?*

In addition to the previous point concerning the reduction in medicine and resource usage, the converse may also be a concern, regarding the *continued* production of medicines. Whether pharmaceutical companies should be (or are) under a duty to continue to produce their products once they have entered the market. Moral justification for such a duty might arise from reliance upon such medicines by individuals, without which, their health conditions would worsen or become unmanageable.

Cases dealing with the question of a continuing duty to supply medicines have arisen in the USA.<sup>174</sup> No such duty was found to arise in these cases. Nevertheless, these cases, whilst unsuccessful, provide a stark account of the moral case for such a duty, regardless of the domestic legal position. A question remains however, whether such a duty could arise when applied in the context of future generations? In essence, should pharmaceutical companies be under a duty to continue to produce medicines which they have developed, such that future generations may benefit from them?

The answer to such a question might be better placed in the realm of ethics than law, given the record of failure in previous domestic court decisions. It would be difficult to conceive of such a duty arising in other industries. No one would expect Ford to continue to produce the Mustang, nor would anyone expect Apple to maintain production of the iPod. Yet perhaps there is something distinctive about the production of medical technology? The essential nature of medicines to human life is indisputable and arguably places an additional ethical weight upon the decision of the pharmaceutical industry, when deciding whether to discontinue a medicine. This may be particularly concerning where the product in question is under patent protection, as it cannot be produced by any other entity. Indeed, were a generic manufacturer to decide to no longer produce paracetamol, there would be little worry, as numerous competitors would quickly flood the market. Yet, for those patented medicines, the decision to end production would, at least for a significant period, preclude entry into the market for viable competitors. Arguably therefore, the duty to maintain production may not be necessary where sufficient intellectual

---

<sup>174</sup> See: William M Janssen, 'A 'Duty' to Continue Selling Medicines' (2014) 40 American Journal of Law, Medicine and Ethics 330.

property reform sufficiently ensures that any medicines which are to be discontinued are simultaneously de-branded such that generic manufacturers can meet market demands. Such an approach arguably aligns with the protection of the human rights of future generations, since it ensures that information is kept in the public domain, where future generations can access it and produce those medicines necessary for contemporary healthcare needs.

When discontinuing medicines, the pharmaceutical industry should be cognisant of both current healthcare needs, but also of the rights of future generations to information needed for production and development of medicines. In tandem, States should consider intellectual property reform, ensuring that medicines which are discontinued from production are not held from public access unnecessarily through intellectual property controls.

## 5. Conclusion

The Pharmaceutical industry has continually evolved throughout history in response to political, economic and technological change.<sup>175</sup> A response to environmental challenges and the rights of future generation is therefore merely the next evolution in the transitory process of industrial development, innately familiar to the pharmaceutical sector. This article has sought to explore how The Principles and the concept of rights of future generations, implicate the practices and duties of the pharmaceutical industry. The Principles make clear that the pharmaceutical industry has duties towards future generations, including protecting the environment, developing novel medicines and ensuring continued access to the means and processes for developing existing essential medicines. How such duties are to be fulfilled is a significant challenge, requiring distinct and diverse approaches. The Principles demonstrate a central need for further collaboration between the industry, states and academic research. Whilst there is a clear role for the pharmaceutical industry, ultimately states must lead in regulating and ensuring compliance with The Principles and the rights of future generations.

Difficulties arise in terms of balancing the responsibilities towards future generations with the rights of current generations, in particular the continuing need to produce affordable generic medicines for those in low-income countries. Nevertheless, such challenges should not be used as justification for failure to align with the values expressed within the Principles, or the transformative strategies required to meet the needs of future generations. The impacts of climate change and environmental pollution may be most acutely felt by those individuals living

---

<sup>175</sup> See: Malerba and Orsenigo, supra n 121.

in poverty. The pharmaceutical industry must therefore move towards a 'greener' approach to research, development and production. They should also consider how their products are protected under current intellectual property regimes, ensuring current access, but also access to information and processes for future development, through open innovation models. Collaboration with States is also key to tackling future health challenges, ensuring access to medicines and anticipating and tackling the health needs of future generations.

The Principles not only contain duties for the pharmaceutical industry but also offer an opportunity for them to lead on necessary changes, to respond to environmental challenges and the needs of future generations. This article acts as a foundation for future research into the role of corporations, including the pharmaceutical industry, in adapting and addressing those challenges posted by the future.