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EDITORIAL

Beyond ideological frames: Population, environment and human welfare – a decade of critical inquiry

David Samways

This twentieth issue of *The Journal of Population and Sustainability* (JP&S) marks its tenth anniversary. Instead of a traditional retrospective of the past decade of publication, in this editorial I want to take a broader view and assess the changes in discourses about population over that decade and their antecedents over the previous three to four decades. In particular, I am not only interested in the content of those discourses but in the interpretive frames through which demographic trends have been perceived, understood and, at times, misrepresented. Such frames are not neutral instruments of observation: they are shaped by interests, anxieties, institutional pressures, historical legacies and shared group identity; yet they are experienced by those who rely on them as sources of clarity rather than of distortion.

This epistemological observation speaks directly to one of the journal's foundational concerns: namely that, at the very juncture when evidence for the ecological significance of population dynamics has reached its greatest empirical solidity, the conditions for rigorous scholarly engagement with population questions have, across many institutional and discursive contexts, become more constrained. Such contraction is amenable to explanation, at least in part, through careful analysis of the interpretive frames by which evidence is received, filtered and differentially acted upon.

This editorial examines each of these frameworks in turn before offering an alternative analysis, and then turns to the contributions to this issue, relating them to this wider perspective. First, however, I give a brief exposition of the theoretical framework employed.

Interpretive frames: A theoretical note

Our comprehension of the world is always mediated by interpretive frameworks – what Stones (2005) calls 'hermeneutic frames' – structures of perception, explanation and evaluation that are simultaneously part of our inner lives and of our shared social world. These frameworks are not subjective creations: they are formed through culture, language, institutions and social relationships, and reproduced through the narratives and taken-for-granted knowledge that surround us. Through internalisation, they become embedded in collective identity and serve as a source of ontological security, experienced phenomenologically not as interpretive frameworks but as direct access to reality itself. Crucially, they are also conditioned by the distribution of power, which renders them ideological in the sociological sense – implying neither conspiracy nor deliberate distortion, but a structural shaping of what can be thought. This is as true of scholars working in this field as of anyone else: the starting point for most is a concern about human impact on the environment and, while philosophical scepticism, empirical rigour and academic self-reflection can support objectivity, they cannot dissolve the frames through which evidence is encountered.

This is not to suggest that empirical reality is a collective fiction. Material conditions – climate change, ecosystem degradation, demographic change – impose constraints that no interpretive frame can override indefinitely. What such frames do shape is which facts are noticed, how they are explained, whose circumstances are rendered visible, and which responses appear plausible or even thinkable. Reality is not produced by ideology, but it is invariably encountered through it. The sections that follow examine three such frames that have structured – and in important respects distorted – public and scholarly engagement with population over the past decade.

Underpopulation anxiety: Globalising a northern crisis

Perhaps the most consequential shift in mainstream media coverage over the past decade and more has been the pivot from concern over overpopulation to

concern about underpopulation (Bricker and Ibbitson, 2019; Hou, 2021; Shute, 2022; Ferguson, 2024; Greenfield, 2025; Monbiot, 2025; Morland, 2026). This reframing is so extensive that a substantial part of the audience for mainstream media now appears to believe that global population is already in decline (Nater, 2025) rather than projected to grow by more than two billion before peaking in the 2080s (United Nations, 2024). The recurring conflation of falling fertility rates with falling population numbers confuses rates with absolute levels (see Delacroix et al. in this issue) – a conflation the prevailing media frame tends to reinforce rather than correct.

This particular framing emerged from the intersection of genuine demographic trends in the Global North – sub-replacement fertility in Japan, South Korea, North America and almost all of Europe – with the economic concerns of those societies: shrinking workforces, pension crises, stagnating productivity and consumer markets. In the context of the dominant economic narrative in which GDP growth is the sole metric of societal welfare, population decline is most frequently perceived as a serious challenge (Vollset et al., 2020), while others have noted that the actual impact on social welfare may be exaggerated (Skirbekk, 2022; Bradshaw and McDermott, 2025; Gietel-Basten and Pardo, 2026).

While these concerns deserve serious consideration, their generalisation into a universal demographic narrative applied to the entire planet is unwarranted. Sub-Saharan Africa, which accounts for the majority of projected future population growth (United Nations, 2024) and where rapid demographic increase continues to outpace infrastructure, economic development and, importantly, climate resilience and adaptive capacity, receives comparatively little sustained attention within this framing except as a source of migration pressure (Smith, 2019; Sear, 2024). The frame thus treats the demographic circumstances of wealthy, ageing, Northern societies as though they represented the global demographic situation as a whole.

Prominent public figures have accelerated this process. Repeated warnings about ‘population collapse’ from commentators such as Elon Musk illustrate how a frame can gain currency less through evidence than through repetition and reach. The legitimacy this has lent to a renewed wave of pronatalist policymaking is among the more significant political consequences of frame-driven demographic misperception, and it is examined directly in this issue by Delacroix and colleagues.

The retreat from population in environmental scholarship

While popular media coverage of population dynamics has focused on anxiety over depopulation, the engagement of academic, environmentalist and policy communities with the population-sustainability nexus over the past thirty years is better characterised by reluctance. As Washington and Kopnina (2022) note, population growth has become a polarised topic in sustainability discourse, with responses in parts of the literature ranging from studied ambiguity to explicit objection to what is characterised as 'blaming' overpopulation. At a more popular level, environmental campaigners such as George Monbiot (Monbiot, 2020) and Naomi Klein (Klein, 2015) have dismissed population growth (along with personal agency and responsibility in consumption) as a legitimate topic of discussion in tackling the environmental crisis.

Some of this resistance has its roots in legitimate ethical concerns. The historical association of 'population control' with imperialism, racism and coercion has led to an understandable suspicion of population discourse within feminist, postcolonial, and social justice scholarship (Coole, 2021). As Steven Sinding (2016) reflected in the very first issue of the JP&S, the population movement that emerged in the 1960s was an unstable alliance between those with demographic objectives and family planners principally concerned with the rights and health of women, infants and young children. Demographic objectives dominated the movement's first phase, which saw total global fertility fall from 6 to 2.5, but the coercive and manipulative policies of some governments precipitated opposition, a shift in favour of the rights and health contingent, and ultimately the Cairo consensus of 1994 – a 'paradigm shift' away from halting rapid population growth and towards the promotion of reproductive rights and individual agency. As Sinding observed, the overall effect was reduced priority for contraception, stagnating or rising birth-rates in some places, and a general lethargy in the field – perhaps most emblematically expressed in the decision to exclude population and family planning entirely from the UN's Millennium Development Goals (Sinding, 2016: 12).

Moreover, while this ethical correction was justified, it consolidated into a hermeneutic frame within which population, as a variable and an object of inquiry, became difficult to address without inviting charges of complicity in historical abuse.

The charge of racism functions in a similar way. Its historical basis is genuine: eugenic thinking did influence much twentieth-century population advocacy, and continued vigilance against its recurrence is warranted (Coole, 2021; Samways, 2022). The charge has, however, also been applied in ways that equate all concern with population with racist intent, foreclosing legitimate scientific and policy discussion by making the topic difficult to address in neutral terms (Coole, 2021; Washington and Kopnina, 2022). Where the available vocabulary for discussing a phenomenon has been shaped so thoroughly by one set of concerns that dispassionate empirical engagement becomes structurally difficult, the result is an ideological frame in the fullest sense – one that is not experienced as a constraint because it has been internalised as a matter of conscience and identity.

The consumption turn and the displacement of population

The 'consumption turn' in environmental thinking performed a comparable silencing function, whatever the merits of its analytical motivations. The argument that per capita consumption, particularly in high-income countries, is a more important driver of environmental harm than population size has considerable empirical support (Samways, 2022). As Maxton and Randers (2016) pointed out in the second issue of this journal, the environmental footprint associated with a child born in an OECD country is thirty times larger than that of a child born in a low-income country, and this asymmetry is both real and morally significant. The consumption frame has, however, also operated as a form of displacement, enabling a body of scholarship attentive to charges of neo-colonialism to treat the population question as resolved when it has more often been set aside – culminating in the clearly ideological claim that environmental impact 'has nothing to do with population numbers' (Dorling, 2026:32). In contrast, despite their evident reticence about discussing population growth in public policy fora, bodies such as the IPCC and IPBES are careful to identify economic growth and population growth as distinct indirect drivers of environmental change: the size of the economy and the size of the population each independently scales the practices and technologies that drive emissions growth and ecological change.

Some caution about crude correlations between population growth and environmental harm is warranted: the benefits of, and responsibility for, the Anthropocene are profoundly unevenly distributed, with the greatest environmental burdens associated with the slow-growing populations of the

Global North (Steffen et al., 2015; Samways, 2022). Oxfam has demonstrated that 52 per cent of cumulative carbon emissions between 1990 and 2015 are attributable to the wealthiest global decile, compared with seven per cent for the poorest half (Gore, 2020). Nonetheless, as affluence rises, the environmental burden shifts from population growth to per capita consumption growth – meaning a larger, wealthier population acts as a powerful multiplier of environmental impact (Samways, 2022). Population growth therefore remains a significant driver and, as the populations of the Global South economically develop to meet their welfare needs and aspirations, their environmental footprints must necessarily increase.

The charge that strategies advocating population stabilisation constitute 'climate colonialism' – shifting responsibility from high-consumption, low-fertility nations onto low-consumption, high-fertility ones – has been subjected to sustained scrutiny by Patrick Hassan (2024) in these pages. Hassan argues that the counter-position, which treats population growth as a distraction from rich-world consumption, amounts to a 'compensation thesis' in which reductions in consumption are assumed to offset population growth. The difficulty is that several studies have cast doubt on whether redistribution alone can provide a good life for the current population, let alone the projected peak, without breaching planetary boundaries (O'Neill et al., 2018); and that between 1990 and 2019, emissions attributable to population growth offset roughly three quarters of the reductions achieved through technological change (Chaurasia, 2020). Moreover, if population growth is treated as morally off-limits, a different form of colonialism follows: the imposition of Western-determined consumption limits on the aspirations of people in the developing world (Hassan, 2024). The result of the consumption turn is what Delacroix and colleagues in this issue describe as a conspicuous absence – a gap in environmental analysis that is the more significant because it is understood not as an omission but as a principled position.

Scientific assessment and the filtering of evidence

The operation of these ideological frames is most apparent, and most consequential, in the distance between the conclusions of major scientific bodies and the content of policy discourse. In their most recent Assessment Report (AR6), the IPCC stated: 'Globally, gross domestic product (GDP) per capita and population growth remained the strongest drivers of CO_2 emissions from fossil fuel

combustion in the last decade' (IPCC, 2023a: 217). Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) specifies 'lowering total consumption and waste, including by addressing both population growth and per capita consumption differently in different contexts' (IPBES, 2019: XXI) as a leverage point for halting biodiversity and ecosystem function loss.

These are not marginal claims advanced by heterodox researchers; they are the considered conclusions of the most authoritative scientific bodies in their respective fields. They have nonetheless been largely filtered out in the translation from scientific assessment to policy agenda. As discussed in the last issue's editorial (Samways, 2026), while the 5th Assessment Report (AR5) (IPCC, 2015) engaged at length with population growth as both a vulnerability risk and family planning as a longer-term mitigation strategy, the following report, AR6 (IPCC, 2023a), signalled a significant pivot away from discussing population beyond the acknowledgement above. Perhaps more importantly, AR6's Summary for Policymakers (IPCC, 2023b) did not mention population growth at all.

The IPBES's acknowledgment of population growth as a factor in the environmental crisis in their 2019 report likewise leaves the issue unresolved, offering no policy recommendations on how it might be addressed. In contrast, their most recent full 'Nexus' report (Harrison et al., 2024) pays significant attention to how sexual and reproductive health rights can slow population growth. Yet, their summary for policymakers (McElwee et al., 2025) plays this down, paying more attention to the vulnerability of populations in developing countries without explicitly connecting sexual and reproductive health rights with either mitigating vulnerability or ecological degradation. The filtering in both the IPCC and IPBES public facing communications is not arbitrary. It reflects a lack of institutional confidence in the face of the frames described above, which render certain conclusions available for policy uptake while leaving others effectively unheard, shaping the reception of evidence in ways that are not themselves apparent to those who receive it.

Escaping the frames: Towards a pragmatic way forward

The academic literature of the past decade has not been entirely in the grip of these frames. A significant body of work has sought to move beyond the consumption-versus-population binary and to examine how population growth, consumption patterns and technological change interact differentially across

ecological domains and income levels (for example: Motesharrei et al., 2016; O'Neill et al., 2018; Bongaarts and O'Neill, 2018; Ganivet, 2020; Belmin et al., 2021). The biodiversity dimension has been particularly instructive (Crist et al., 2017; Tilman et al., 2017; Marques et al., 2019; Naggs, 2019; Dasgupta, 2021; Cafaro et al., 2022): land-use change driven by agricultural expansion is the dominant direct driver of biodiversity loss globally (Jaureguiberry et al., 2022), and in low-consumption, high-fertility regions demographic growth is frequently its primary engine (Maja and Ayano, 2021; Hemp et al., 2025).

The justice dimension has also been subjected to more rigorous scrutiny. The assumption that justice considerations straightforwardly favour ignoring population growth has been contested by scholars who argue that the genuine ethical imperative is to ensure that population stabilisation occurs through rights-based means – voluntary family planning, women's education, economic security – rather than through coercion or neglect (Crist et al., 2017; Cripps, 2017; Coole, 2018; Delacroix and Engelman, 2023; Hassan, 2024). Such approaches are not only ethically defensible but empirically effective: voluntary family planning, girls' education and female economic empowerment consistently produce fertility decline without coercion, and are therefore immune to the objections that have historically foreclosed population discourse (Washington and Kopnina, 2022). Urbanisation, too, is a robust driver of fertility transition across contexts, operating through shifts in labour markets, the opportunity costs of childrearing, and changing gender norms (Adhikari et al., 2025). As Elizabeth Cripps argued in the second issue of this journal, to assume that population growth among the global poor may be set aside because of their low per capita emissions is to assume either that they will remain poor, or that poverty can be ended, for increasing numbers, without worsening environmental impact (Cripps, 2017). Neither assumption survives scrutiny, and both reflect the operation of frames that are more comforting than coherent (see Rosenthal in this issue for an instructive example of rights-based, non-coercive policy instruments).

Crucially, the policy instruments that constitute the ethical path through population discourse are not merely instrumentally useful for sustainability: voluntary family planning, women's education and female economic empowerment improve the welfare of billions of existing people directly and immediately, quite independently of their demographic effects. The case for honestly acknowledging

the population-environment-consumption nexus is therefore not only a case about future generations; it is a case about the billions of people alive today whose life chances depend on access to reproductive health services, to education and to the economic opportunities that drive fertility transition.

A further dimension of the nexus that has received insufficient attention is the relationship between fertility reduction and climate adaptation and resilience. The IPCC's Sixth Assessment Report identifies population growth as a key amplifier of climate exposure and vulnerability, particularly in low-income, high-fertility regions where demographic growth compounds pressure on water, food, and infrastructure systems already stressed by climatic change. At the household level, voluntary fertility reduction – achieved through education, economic empowerment and access to reproductive health services – increases per-capita resources available for adaptation, improving resilience to climate shocks through better nutrition, savings capacity, and investment in more secure livelihoods. At the aggregate level, slower population growth reduces the scale of the adaptation challenge itself: fewer people exposed to the same hazards, lower demand growth on already-stressed systems and a smaller infrastructure deficit to close under deteriorating climatic conditions. As made clear in our 2023 special issue, *Vulnerable Populations: The Role of Population Dynamics in Climate Change Resilience and Adaptation in Africa,* rights-based approaches to population stabilisation are therefore not merely complementary to climate adaptation policy – in high-vulnerability regions they are among its most cost-effective and ethically defensible instruments (Adedini, 2023; Passano et al., 2023; Samways, 2023).

The limits of the demographic transition model as a universal template (Bongaarts, 2022) – and its partial replacement by a recognition of demographic divergence, particularly the slower-than-projected fertility decline in sub-Saharan Africa (Bongaarts, 2017) – represents a case of empirical pressure partially overcoming a frame. The demographic transition model cannot be regarded simply a neutral description of an autonomous demographic processes; it also served as a frame that made deferred action seem reasonable, allowing policymakers and scholars to treat population stabilisation as something development would automatically deliver in due course (Coole, 2018; Samways, 2022). The growing recognition of its limits is, in part, a recognition of the ideological work it has been performing.

The planetary boundaries framework, widely adopted since its proposal by Rockström and colleagues (Rockström et al., 2009), has been central to this re-opening of analytical space, providing population–environment arguments with a new scientific vocabulary and greater institutional legitimacy. While population was not a primary concern of the original framework – which centred on biophysical thresholds for a 'safe operating space' for humanity – subsequent scholarship has drawn on it to develop more population-oriented arguments. Most significantly, O'Neill et al. (2018) used the planetary boundaries framework to demonstrate that, while the basic physical needs of seven billion people could in principle be met within biophysical limits through equal resource distribution, achieving more qualitative dimensions of human wellbeing would require two to six times the level of resources associated with basic needs. They argue that, with radical improvements in social and technical provisioning systems and a global focus on consumption sufficiency, a good life for seven billion people could be achieved without breaching planetary boundaries. In the absence of such changes, their modelling implies that only 1.2 to 3.5 billion people could enjoy a 'good life' within planetary boundaries (Samways, 2022).

O'Neill et al.'s analysis represents a more sophisticated reworking of 'carrying capacity' estimates in the 'equal shares' optimum population tradition which has sought to estimate a sustainable population predicated upon an equal distribution of resources and a good standard of living (Daily, Ehrlich and Ehrlich, 1994; Pimentel et al., 1994; Lianos and Pseiridis, 2016; Tucker, 2019; Dasgupta et al., 2021). Despite differences in methods and assumptions across several decades, these estimates (ranging from 1 to 3.6 billion) tally remarkably well with those implied by O'Neill et al.'s analysis under a business-as-usual trajectory.

However, Joel Cohen (2017) has argued that estimates of carrying capacity have varied considerably as they depend not only on technical questions of resources and technology (as in O'Neill et al.'s provisioning system reforms) but on normative ones: what is to be sustained, for whom and at what standard. As he observed in JP&S Volume 2 No 1:

> How many people the Earth can support depends in part on how many will wear cotton and how many polyester; on how many will eat beef and how many bean sprouts; on how many will want parks

> and how many will want parking lots; on how many will want Jaguars (luxury sports cars) with a capital J and how many will want jaguars (endangered felines) with a small j. These choices change with time and circumstance, and so will how many people the Earth can support. (40–41)

Carrying capacity is in this sense as much a value-laden construct as a biophysical one, and the equal shares figure is better understood as a heuristic device for the expression of a particular distributive ideal rather than as a natural ceiling.

The commendable normative aspirations of the equal shares tradition are also its principal weakness. The binding constraint is *achievability* rather than *desirability*: demographic momentum places the reduction to three billion well into the next century, while the rapid transformations in fertility, consumption and value orientation that any other path would demand (including O'Neill et al.'s achievement of an equally good life for 7 billion) would disrupt the ontological security anchoring agents' everyday lives, generating resistance that renders even the most defensible proposal politically inert. A pragmatist alternative, such as that advanced in Earth4All's Giant Leap scenario (Callegari and Stoknes, 2023), instead treats sustainability as a direction of travel rather than a fixed threshold, pursuing gradual, broadly acceptable transitions that work with existing structures of motivation rather than against them. On this view, a global population of around six billion by 2100, at improving levels of welfare and with environmental degradation in retreat, satisfies none of the equalitarian optima but constitutes a defensible and achievable basis for longer-term sustainability (Samways and Anderson-Samways, 2026). Nonetheless, even these less arduous ambitions, given the current state of global cooperation and governance, would still require a momentous shift in the present geopolitical trajectory.

Articles in this issue

The four articles collected in this issue engage, from different disciplinary and regional starting points, with the core problematic identified above: the disjunction between the urgency of population dynamics as a variable in global environmental and social change, and the inadequacy of the frames through which that variable is currently apprehended.

Delacroix et al.: Pronatalism, planetary boundaries and reproductive rights

In *Why Pronatalism Fails the Planetary Health Test,* Céline Delacroix and thirteen co-authors – spanning population health, ecology, reproductive medicine, law and environmental science – mount a sustained critique of the growing global trend towards pronatalist policy. They argue that efforts to boost birth rates, however economically motivated, are ecologically indefensible, representing a dangerous mismatch between short-term demographic management and long-term planetary health. Pronatalist discourse, they contend, conspicuously ignores the concept of planetary boundaries, framing demographic decline purely as an economic problem while externalising its environmental costs onto future generations. Drawing on recent scientific assessments, including the 2026 Water Bankruptcy report (a major scientific assessment of global freshwater depletion) and the IPCC's Sixth Assessment, the authors show that population size remains a key variable in ecological degradation, from resource depletion and biodiversity loss to accelerating climate change.

The article also confronts the factual premises of pronatalism, observing that fears of 'population collapse' consistently conflate falling fertility rates with absolute decline, obscuring the projected growth of global population from 8.2 billion today to a peak of approximately 10.3 billion in the 2080s; the appropriate response to the genuine challenges of ageing societies, the authors argue, lies in progressive social and labour policy rather than in raising birth rates. They further demonstrate that pronatalist agendas frequently undermine women's reproductive autonomy, and that universal access to voluntary family planning is both a matter of justice and an effective, rights-based mechanism through which population can stabilise – an argument lent particular urgency by recent reductions in US funding for global family planning services.

Greguš: Population growth and global security

Jan Greguš makes a forceful case that population growth is not only an environmental concern but a fundamental and chronically underappreciated driver of global insecurity. Conventional security discourse – preoccupied with military threats, terrorism and geopolitical rivalry – consistently fails to address population dynamics as an underlying cause of the very instabilities it seeks to manage. Drawing on security studies, demography, ecology and public health,

the article proceeds systematically through eight interconnected security threats exacerbated by population growth: food insecurity, water scarcity, pandemic emergence, climate change, unemployment, social conflict, violent extremism and forced migration. Particular attention is paid to sub-Saharan Africa, where rapid growth, large youth cohorts, unemployment and environmental stress converge to produce conditions highly conducive to radicalisation and conflict, with the 'youth bulge' receiving sustained analysis as a structural risk factor for violence.

The article's prescriptive dimension is equally important: the most strategic, ethical and cost-effective response, Greguš argues, lies not in military expenditure or reactive crisis management but in proactive investment in voluntary family planning, contraceptive access, and the education and empowerment of women and girls – a call for long-term, preventive thinking in security policy whose logic is analogous to that of preventive medicine.

OHirsi: The Wheelbarrow Motion Theory of irregular migration

In his contribution to this issue Adam OHirsi introduces the Wheelbarrow Motion Theory (WMT), a novel and imaginative conceptual framework for understanding why irregular migration from the Global South to the Global North persists and accelerates despite increasingly stringent border enforcement. Where existing frameworks – most notably Lee's (1966) classical push–pull model – treat climate change and corruption as separate or merely additive drivers of displacement, WMT reconceptualises them as mutually reinforcing forces that together generate migration momentum substantially greater than either could produce in isolation. A critical narrative review spanning the Horn of Africa, the Sahel, the Northern Triangle of Central America and South Asia reveals a consistent pattern: climate shocks erode livelihoods and household resilience, while corruption simultaneously undermines adaptation programmes, diverts humanitarian aid and restricts access to legal mobility pathways. Where these forces combine, displacement becomes structural rather than episodic, and irregular migration emerges as a rational response to severely constrained choices.

OHirsi also advances a pointed critique of security-centred Western policy responses – deportation, detention, border externalisation and anti-smuggling operations – which are shown to reroute migration flows rather than reducing

them, while frequently generating serious human rights abuses. Such policies, he argues, fundamentally misdiagnose migration as a border-management challenge rather than a symptom of interacting climate and governance failures; the article concludes with recommendations centred on governance reform, anti-corruption safeguards in climate finance, investment in climate-resilient livelihoods and expanded legal migration pathways.

Rosenthal: Child support policy as demographic variable

Michael Rosenthal presents the first large-scale cross-national analysis of child support policy as a demographic variable. Drawing on a novel dataset covering 91 countries across six continents, the article compares the strength and structure of national child support systems against 21 social, economic, health and environmental indicators. The central finding is striking: countries with robust systems – characterised by a substantial number of enforcement mechanisms, a dedicated administrative agency and/or a publicly funded assurance programme – consistently outperform weaker systems across a remarkably broad range of metrics, including substantially lower rates of unintended pregnancy and abortion, reduced infant and maternal mortality, lower adolescent birth rates, higher female educational attainment and greater female parliamentary representation.

Most pertinent here, strong child support enforcement is associated with significantly slower rates of natural population increase – a relationship Rosenthal attributes to the financial accountability that enforceable obligations create, encouraging more deliberate reproductive decision-making. Unlike coercive demographic interventions, child support enforcement operates through economic incentives, commands broad cross-partisan support and is consistent with reproductive rights: an underutilised instrument, Rosenthal argues, of both welfare and population sustainability policy.

Conclusion

The analysis presented here suggests that the principal obstacles to rigorous thinking about population dynamics are not primarily informational. The data, the scientific assessments, and the ethical frameworks for rights-based population engagement are all available. What shapes their reception is the set of interpretive frames – operative in mainstream media, in environmental scholarship, and in policy discourse – through which they are encountered. As argued throughout

this editorial, such frames are ideological not in the pejorative sense of deliberate distortion, but in the more fundamental sense that they are the medium of perception itself, encountered as clarity rather than as constraint, and therefore difficult to subject to critical examination.

The contributions gathered in this issue can be read as an effort to do precisely that: to make those frames visible, to subject them to evidence-based scrutiny, and to reconsider the place of population in debates about environmental sustainability, justice and human futures. As this journal enters its second decade, the challenge is not to resolve these debates conclusively but to ensure that the frames through which population is discussed remain open to the critical examination that this journal exists to pursue. That challenge carries a human cost when it fails: the ideological foreclosure of the population-environment-consumption nexus does not merely impoverish academic debate. It shapes resource allocation, forecloses policy options, and leaves unmet the needs of the billions of people – particularly women in high-fertility, low-income regions – whose welfare is most directly implicated in how these questions are answered.

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PERSPECTIVE ARTICLE

Why pronatalism fails the planetary health test

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Keywords
Planetary health, planetary boundaries, pronatalism.

In their 'World Scientists' Warning of a Climate Emergency 2022', leading climate scientists issued an unambiguous call to action: 'The very future of humanity depends on the creativity, moral fiber, and perseverance of the 8 billion of us on the planet now' (Ripple et al., 2022: 1152). They emphasised the need to equitably reduce ecological overshoot and pursue massive-scale climate mitigation and adaptation. A key recommendation was to stabilise the human population and allow it to gradually decrease in size by strengthening education and reproductive rights for girls and women.

The resurgent wave of pronatalist policies worldwide runs counter to this idea. Pronatalist ideologies advocate increasing birth rates as a rational response to fertility decline associated with the fertility transition – the shift from high to low fertility. Such policies aim to maintain fertility at or above replacement level to avoid the social and economic challenges that may arise from ageing populations. The notion of planetary boundaries, the limits to what the Earth can sustain, is conspicuously absent from these discussions.

This omission reflects a broader reluctance to acknowledge the role of the unprecedented scale of human population growth as a driver of environmental degradation. Human population growth has already imparted significant ecological cost, contributing to the depletion of natural resources, a warming planet, widespread biodiversity loss and a mounting ecological debt that will be passed on to future generations. Proposing to boost birth rates in response to declining fertility may seem like a reasonable strategy from an economic perspective, to avoid the short-term burden of a proportionally higher ratio of retirees to working age people, but only if one ignores the scale and urgency of the environmental crisis and its associated long-term negative impacts.

Recent environmental assessments such as the 2026 Water Bankruptcy report (Madani, 2026) highlight that we have moved beyond an era of temporary, reversible and isolated environmental crises, and that reliance on technological solutions alone is no longer sufficient. The scale and interconnectedness of these pressures point to the need to change our whole development models, a

perspective echoed in the call to move beyond GDP as the dominant measure of progress and to more fully recognise the value of environmental systems (Taylor, 2026). In this context, reducing aggregate demand emerges as a central lever for safeguarding basic human needs while preserving ecological integrity. Science unequivocally tells us that population size is a key variable in driving environmental degradation (Shukla et al., 2022). Every human has an impact on nature, whether their footprint is large or small, and the aggregate impacts are currently overwhelming ecosystems. Moreover, individual footprints are not static; they evolve as wealth grows and consumption increases, and with the conditions of our lives.

Ultimately, investing in reproductive rights and voluntary family planning – across all settings – supports both human wellbeing and environmental sustainability. When women have the agency to make informed choices, they tend to opt for smaller families (Götmark and Andersson, 2023). Yet when demographic objectives are prioritised over individual reproductive choice, pronatalist policies often pave the way for restrictive or coercive measures that undermine women's agency and limit their ability to reproductive self-determination (Bajaj and Stade, 2023).

Family planning plays a role not only in advancing reproductive self-determination, gender equity and justice, but also indirectly, in shaping population trends. Since peaking at a 2.3 per cent annual growth in 1963, global population growth has slowed to under one per cent today – a shift that could hardly have occurred without increased access to voluntary contraception and reproductive agency (Götmark and Andersson, 2023). Despite the immense need for family planning – with hundreds of millions still unable to make free and informed reproductive choices (United Nations Population Fund, 2022) – support for these services is dwindling. The US, long the largest donor – providing forty per cent of global family planning aid in 2023 – abruptly cut funding in 2025, ending the world's leading source of support (Singh et al., 2025).

Finally, the pronatalist discourse is largely misconceived. Perceptions of fertility decline often conflate lower birth rates with a shrinking population (Dowd, 2025). In reality, while global fertility is declining, the number of women of reproductive age is projected to rise from 2 to 2.2 billion in coming decades (United Nations, 2025). The global population is projected to expand from 8.2 billion in 2024 to

a peak near 10.3 billion in the mid-2080s, adding over 2 billion people (United Nations, 2024). For perspective, the global population in 1950 was just 2.5 billion. Fears of 'population collapse' are thus largely bogus; while certain countries will experience shrinking populations, the world as a whole faces continued growth – with profound implications for planetary health. It is with all these dimensions in mind that we must examine the ideological shift toward pronatalism.

Recent setbacks in both environmental efforts and reproductive rights are not isolated events – they are intertwined, and both are symptoms of the same phenomenon: the belief that human ingenuity can endlessly outrun planetary limits. Population growth and decline pose different challenges, and they are not reciprocal problems. We are better equipped to manage low fertility's social and economic consequences than the cascading effects of growing environmental destruction. As Vegard Skirbekk suggests, the challenges associated with ageing societies are manageable and can represent opportunities to develop good policy interventions (2022). Efforts such as implementing progressive tax policies, strengthening intergenerational social safety nets, easing labour migration and integrating seniors into meaningful roles in society are rights-based and effective approaches that should receive our full investment to support an ageing population and stay within ecological boundaries.

Taking a planetary health and evidence-based assessment of both demographic trends and ecological trajectories supports the view that encouraging the human population to stabilise and gradually decrease in size – by advancing reproductive rights and ensuring universal access to education and healthcare – remains a valid policy objective.

Disclaimer

The views expressed in the paper are solely those of the authors and do not necessarily reflect the positions of their respective institutions.

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RESEARCH ARTICLE

Scientists' warning: Population as a threat to security

Jan Greguš[1]

Abstract

A high population is not only causing environmental problems, such as climate change, degradation and pollution, but also security threats, including food insecurity, water scarcity, unemployment, social conflict, violent extremism, resource-driven wars, and forced migration. If societies continue to view these threats in isolation and ignore population as a contributing factor, the security crisis will not be resolved long-term. Security is achievable, however, if governments make rational choices to reduce population via embracing reproductive ethics of small(er) families and provide affordable access to contraception to all those who ask for it. These are inexpensive interventions that deliver rapid returns, but a lack of political will reflects a lack of understanding that human reproduction has not only ethical, but also security implications. It is also essential to put emphasis on placing human and environmental security ahead of national security, because security is no longer a country- or region-specific matter, but rather a shared burden and one that humanity as a whole must (ethically) respond to.

Keywords

Population growth, human security, environmental security, reproductive ethics, contraception.

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Introduction

In current scholarship, security issues are often discussed separately from issues of growing human population. In my view, without targeting population as a security threat, there can be no long-term human security. This paper explores the links between security, threats to security and population. It aims to bring the topic of population into security discourse. Furthermore, it links both security and population with reproductive ethics; when reproduction is viewed as the problem, it can also be proposed as a solution.

Security as a concept

Security is not a fixed concept but an evolving one. Before 1990, literature took a narrow Hobbesian meaning which included military, political and economic security provided by the state as part of the social contract. The end of the Cold War, the process of globalisation and the gradual transition from the Holocene to the Anthropocene phase of planetary history triggered the reconceptualisation of security towards a wider scope that has also included societal and environmental dimensions (Brauch, 2008: 27–43). New uncertainties are increasingly rooted in environmental and societal, rather than political, instabilities. Brauch (2011: 61) explains that, at present, security no longer represents a situation free of dangers, rather an insurance against a diversity of emergent threats. From a philosophical perspective, this change signifies the shift of focus from protection against concrete dangers towards insurance in the context of abstract threats.

Since the late 1990s, parallel debates in security studies, social sciences and within international organisations have emerged. While the term 'national security' refers to preservation of the state and its institutions and governance structures, 'human security' refers to people's social, economic, political and environmental vulnerabilities and threats (Brauch, 2011: 62). Human security includes the environmental dimension, such as natural disasters, extreme weather and insufficiency of natural resources. As Brauch (2011: 62) says: 'The answers to the questions of security for whom, from whom, by whom, of what values, from what threats and by what means differ fundamentally between these concepts'.

Security has both objective (physical) and subjective (emotional) dimensions (Wolfers, 1962: 147–165). From an objective perspective, it is achieved when the threats are avoided, prevented, managed, coped with, mitigated and adapted to,

whether by individuals, societal groups, the state or international organisations. From a subjective perspective, security is achieved when fears of the threats are allayed (Brauch, 2011: 61). The perceptions of security threats can be easily distorted. They also depend on the worldviews and mindsets of security experts and policymakers (Booth, 1987: 39–66), who can distort the assessment and attitudes to new challenges and threats. International attempts to combat these challenges and threats are often paralysed by opposing worldviews and interests.

Threat as a concept

Threat means: 1. a stated intention to inflict injury, damage, or another hostile action on someone, 2. a person or thing likely to cause damage or danger and 3. the possibility of trouble or danger (Soanes, 2000: 1199). Threats to security can be intentional or unintentional. They can come from within and outside the state (Buzan, 1983: 57). Buzan (1983: 75–83) differentiates between military threats (seizure of territory, invasion, occupation, change of government, manipulation of policy), economic threats (export practices, import restrictions, price manipulations, default on debt, currency controls) and environmental threats (damaging the physical base of the state). Environmental threats consist of floods, landslides, droughts, tsunamis, hurricanes, wildfires, extreme temperatures and earthquakes. Their impacts are often intensified by other threats such as poverty, food insecurity and inadequate housing in highly vulnerable flood-prone and coastal areas (Brauch, 2011: 106).

While many threats have been specifically and repeatedly studied and discussed, one that has a major impact on security has been overlooked: population and its demographic dynamics.

Population as a threat

Population is one of the factors in the Ehrlich-Holdren equation on environmental impact of human activities: $I=PAT^2$ (Greguš, 2023: 192). It is also an important, though often neglected factor that has a major influence on security, both national, human and environmental. The scale, density and growth of the human population

2 The relationship between population and environmental impact was developed into this formula, where I is the environmental impact, P is population (the number of humans), A is affluence (material resource consumption and concomitant pollution per person), and T is technology (or the relative efficiency with which consumption and production are achieved).

contributes to a number of areas, e.g. climate change, environmental degradation and pollution, resource depletion, increase in municipal waste, biodiversity loss, deforestation and desertification, water scarcity, food insecurity, starvation and malnutrition, pandemic emergence, inadequate education and healthcare services, increased poverty, inadequate housing, forced migration, climate refugees, radicalisation, extremism, widespread conflict and resource-driven wars (Greguš, 2023: 191). These problems represent direct or indirect threats to security. However, what is important to highlight is the fact that it is not simply the total population size and its ongoing growth, but also the shift in sizes among different populations as well as the shift in the population structure, that are fuelling these problems.

Population size and population growth

In the latter half of the twentieth century, humanity experienced unprecedented population growth. This expansion is projected to continue, with Africa, most notably Sub-Saharan, leading the charge (Greguš and Guillebaud, 2020: 409–410). This region's population, 177 million in 1950, is now 1.257 billion (Macrotrends, 2025) and is likely to reach over 3 billion in 2100 (UN, 2024). Of the 47 countries with the highest global fertility rates, 32 are in this region and the populations of 18 of these countries are projected to reach at least double their current size by 2050.

Within this context, Nigeria emerges as a significant player, standing as Africa's most populous, the world's eighth most populous nation (Gbaka et al., 2024: 2). It is one of the fastest-growing populations globally with astonishing record: a country with a population of 37 million in 1950 now sits at 234 million (Macrotrends 2025) and is projected to reach 477 million in 2100 (UN, 2024).

As such, this country of 923 thousand square kilometres will surpass the whole European Union, at a size of 4.233 thousand square kilometres with a projected population of 419 million in 2100 (Eurostat, 2025), and the United States, at 9.876 thousand square kilometres with a projected population of 421 million in 2100 (UN, 2024).

Population structure and the 'youth bulge'

While population size and growth are important factors, structure should also be considered. In countries with fast-growing populations, there is a high proportion of young people, also known as a 'youth bulge'. Its presence is a predictor of

civil unrest (Cincotta et al., 2003). Current scholarship suggests that surplus populations of 'idle youth' excluded from economic opportunity are prone to being radicalised and pulled into violent (and other) forms of extremism (UNDP, 2023: 71). This trend is particularly prevalent in a population bulge of young men aged 15–29. The overwhelming majority of soldiers, terrorists, criminals, political radicals, as well as football hooligans, are men in this age group. ISIS in Iraq and Syria, the Taliban in Afghanistan, Boko Haram in Nigeria, warn-torn Liberia, or the Rwandan genocide can serve as examples in which it was predominantly young men who joined extremist groups. They were frequently from sexually conservative societies with no jobs. They could not marry and, as such, were easy recruits for any extreme political or religious teaching (Potts et al., 2015: 507).

Potts and Hayden (2010: 63–97) in their book *Sex and War* explain there is an obvious link between a high birthrate, a high proportion of young men in the population and the occurrence of violence and extremism. Unmarried men often form bands of vagabonds (Hudson, 2002: 5–38). Most violent crimes are committed by young men. Potts (2006), who devoted a lot of effort into this sphere, puts it this way:

> Just as smoking is a risk factor for lung cancer, so a high proportion of young men in the population compared with older men is a national risk factor for violence. Not everyone who smokes dies of cancer, but many do; not all nations with a high ratio of younger to older men spawn terrorists, but many do. (Potts, 2006)

This view aligns with the United States 9/11 Commission Report which explicitly stated that 'High birth rates … have produced a large, steadily increasing population of young men without any reasonable expectation of suitable or steady employment – a sure prescription for social turbulence' (National Commission, 2004: 54).

This was the case of Afghanistan in 2001. Its population, including that of young men, is dramatically increasing: 7 million in 1950, 20 million in 2001, 44 million in 2025 (Macrotrends, 2025) with a projection of 129 million in 2100 (UN, 2024). In summary, young populations, i.e. those with a low median age, are often more conflict-ridden than those with a higher median age (Potts et al., 2015: 507).

Threats to security

Many studies indicate that demographic expansion poses threats to security. For the purposes of this paper, they will be divided into eight main issues.

Population and food insecurity

Food insecurity means: 1. a limited supply of adequate food in a household; and/or 2. the inability of a household to obtain sufficient quality foodstuffs in a socially acceptable way (Kendall et al., 1996: 1019–1020). More than 673 million people, 8 per cent of the global population, experienced hunger in 2024. There have been notable improvements in southern Asia and Latin America. Unfortunately, this positive trend contrasts sharply with the steady rise in hunger across Africa and western Asia. The proportion of the population facing hunger in Africa surpassed 20 per cent in 2024, affecting 307 million people, while in western Asia 13 per cent of the population, i.e. almost 40 million people faced hunger in 2024. It is projected that 512 million people could be chronically undernourished by 2030, with almost 60 per cent in Africa. (WHO, 2025). In 2024, the global prevalence of food insecurity was 28 per cent, accounting for 2.3 billion people. This figure is 335 million more than in 2019, before the COVID-19 pandemic and 683 million more than in 2015, when the United Nations Sustainable Development Goal to eliminate hunger was adopted (WHO, 2025).

Food insecurity also exacerbates physical and mental disorders (Lee and Frongillo, 2001: 94–99), various infectious diseases (Oluoko-Odingo, 2011: 1–20) and high numbers of premature deaths (Men et al., 2020, 53–60). It represents a major obstacle in achieving the Sustainable Development Goals and leads to economic and non-economic problems (Battersby, 2017: 115–129). Risks of violent conflict are also elevated since it is well-documented that hunger can lead desperate men to desperate actions, as it did in the case of the Rwandan genocide (Gasana, 2002: 24–33).

A growing population is among one of the most crucial factors contributing to food insecurity (Molotoks et al., 2021: 1–13). Producing sufficient food for a growing population has always been a challenge. Additional mouths impose pressures on agricultural production (Hall et al., 2017: 124–135). Kousar and his colleagues conclude that population growth and urbanisation have a significant and negative impact on food security (Kousar et al., 2021: 1). Urban growth tends

to concentrate in the most fertile areas. Food insecurity is exacerbated by taking these areas out of based production (Kousar et al., 2021: 16). A further driver of food insecurity is affluence changes in food consumption (FAO, 2025) since they require a doubling or more of agricultural production (Alexandratos and Bruinsma, 2012).

Population and water scarcity

Water scarcity means the lack of fresh water resources fails to meet the average water demand. There are two types: 1. physical water scarcity occurs where there is not enough water to meet all demands, and 2. economic water scarcity exists where there is a lack of infrastructure or technology to deliver water to households affordably (Caretta et al., 2022: 560). Half the world's population, i.e. 4 billion people, are assessed as being currently subject to severe water scarcity for at least some part of the year due to climatic and non-climatic factors (Caretta et al., 2022: 558). It is a major problem because water is central to drinking and sanitation. Inadequate sanitation is a problem for 2.4 billion people who are exposed to diseases such as cholera and typhoid fever and other water-borne ailments. Many of these people, mostly children, die each year from diarrheal diseases alone. Water scarcity is also a significant driver of food insecurity (Mahlknecht et al., 2019: 1–15) because it is an essential requirement for agriculture production (Wolde et al., 2020: 1–15) and for cooking and food processing (Pahl-Wostl, 2019: 256–367). Therefore, water scarcity increases food insecurity.

The growing population requires more and more water for drinking, agricultural production and industrial production. Humans have also polluted many water reservoirs. Further, human-made climate change is altering patterns of weather, causing shortages and droughts in some areas and floods in others. Should current trends continue how they are, this situation will only get worse. By 2025, two-thirds of the world's population may face water shortages. For example, the city of Kabul could become the first city in the world to run completely dry (MercyCorps, 2025). Water scarcity and food insecurity pose security threats as people move en masse and intensify competition with other groups for scarce resources. Drought is believed to have contributed to triggering the Syrian civil war in 2011 (Gleick, 2014) although its contribution has been challenged (Eklund et al., 2022). While the concept of 'water wars' remains contentious (Biswas and Tortajada, 2019), water is identified as a trigger, weapon or casualty in almost 2000 past conflicts (Pacific Institute, 2025).

Population and pandemic emergence

2020 was the year when the COVID-19 pandemic overshadowed all other global challenges which humanity faced. It was not only a healthcare issue, but also a security threat because it affected the functioning of states, their institutions and people's access to essential goods and services. While some might think the problem is over and no other pandemics lie ahead, experts know better. New diseases and outbreaks of pandemic scale are a near mathematical certainty (Qui, 2020). The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) released a major report which stated that nearly all known recent pandemics and emerging diseases, including Ebola, Zika, Nipah encephalitis, influenza, HIV/AIDS and COVID-19 are zoonotic diseases that spread due to close contact between wildlife, livestock and humans (IPBES, 2020). It warned that there are five new diseases emerging in humans every year and that an estimated 1.7 million currently undiscovered viruses are thought to exist in mammal and bird hosts, between 540–850 thousand of which could potentially infect humans (IPBES, 2020).

There is a clear connection between population pressure and pandemics. Zoonotic diseases are on the rise due to the overexploitation of nature (destruction of wild habitats, vast and relentless deforestation), and the increasing consumption of meat products. Such consumption, driven by a growing number of human consumers and their increasing purchasing power in emerging economies, is projected to double by mid-century (FAO, 2025), which will heighten the risk of new pandemics. Since intensive agriculture brings animals into closer contact with humans, it creates an environment that enables the easier transmission of new viruses from animals to humans.

In addition, the triple threat of human encroachment into natural habitats, urbanisation and globalisation increases exposure to new viruses. First, a growing population means people must expand into areas where they can encounter infected species. Subsequently, urbanisation, the movement of people from rural areas into cities, increases urban population density. Large human populations in cities and megacities represent ideal conditions for diseases to spread. Lastly, globalisation results in close contact among populations. Their greater and faster movement within and between countries means diseases can spread more rapidly and extensively (Greguš, 2021: 89–90). In summary, continued population growth and environmental destruction fuel the risk of future pandemics.

Population and climate change

Nine dimensions of earth system regulation have been postulated, each set by a measurement beyond which planetary systems become unstable (Steffen et al., 2015). Seven of these measurements, or boundaries, have been exceeded to date (PBScience, 2025). Three interrelated boundaries pose particularly direct threats to human societies: climate change, the global freshwater cycle and ocean acidification. Deeper understanding of these issues is complicated by intrinsic positive feedback loops, substantial lag times between system change and experiencing the consequences of that change, and the fact these different boundaries interact with one another in ways that yield surprises (Kareiva and Carranza, 2018: 5).

Climate change leads to extreme weather events and catastrophes, such as droughts, floods, heatwaves, storms, sea-levels rising and mega wildfires, which directly or indirectly threaten security (Kareiva and Carranza, 2018: 6). In addition, climate change, as with the freshwater cycle and ocean acidification, is directly connected to food and water provision. As such, climate change induced events and catastrophes can trigger conflicts (Kareiva and Carranza, 2018: 5). However, while all of humanity is – and will be – in this together, the world's poorest communities will feel the effects and consequences of climate change first and most (WEF, 2023).

Climate change is leading to a significant increase in more frequent extreme weather events and catastrophes in Sub-Saharan Africa, including flood and droughts and other consequent degradations of valuable natural environments and the resources needed for life. Somalia, for example, has experienced prolonged drought, leading to the worst famine in half a century (UNDP, 2023: 51). Sub-Saharan countries face extreme environmental threats including water scarcity and food insecurity–which are correlated with vulnerability to terrorism (UNDP, 2023: 17).

The growing world population, with increased production, consumption and over-exploitation of nature, is what is fuelling these changes. While technological solutions are important, like curbing emissions, they are insufficient (O'Sullivan, 2023). If humanity is to overcome this existential challenge, it must curb greenhouse gas emissions per person but also curb fertility. Both are necessary (Greguš, 2022).

Due to demographic momentum, changing birth rates shift the population gradually at first, while large differences only emerge decades later. While some have argued that bending the curve on global population growth will be too slow to affect climate change, they are ignoring the more rapid impacts on the rate of population growth. It translates directly into reducing emissions from construction and deforestation, both emissions-intensive activities. Rapid impacts also include improvements in family food security and children's access to education, contributing to climate change resilience. Reducing birth rates cannot compete in any way with other efforts to reduce emissions–in every case, they increase the impact of those investments. For example, they magnify the rate at which new renewable energy capacity can displace fossil fuels rather than merely lessening the growth of energy demand (Lowe et al., 2022). If it takes decades to achieve big gains, this situation increases the urgency to get started. The delayed benefits are similar to those from planting forests, but nobody argues that planting forests is too slow of a solution. As the Chinese proverb advises, the best time to plant a tree is 20 years ago, but the next best time is today.

Population and unemployment

Population expansion not only leads to food insecurity and water scarcity, but it is also associated with unemployment and poverty. Population growth frequently outstrips a country's ability to provide basic services and jobs, thus leading to unemployment and poverty. There are many studies which have explored the connection between population growth rate and its influence on unemployment levels (Gbaka et al., 2024: 2). The countries with the fastest growing populations tend to rank highly on global indices of youth unemployment, hunger, poverty, environmental degradation and fragility (Walker, 2016). Unemployment and poverty are not directly security threats, but they can provoke social conflict and violence. Young men are particularly readily provoked, as discussed above in relation to youth bulges.

Population and social conflict

A large increase in population makes social conflict more likely. There are many studies confirming this claim. Homer-Dixon (1994: 39–40) studied the connection between population growth, pressure on environmental resources and conflict, and concluded that poor countries are more vulnerable to environmentally induced conflicts. Tir and Diehl (1998: 319–339) estimated that population growth

has a significant impact on military conflict, especially in poor countries. Hauge and Ellingsen (1998: 299–317) found that factors such as deforestation, land degradation and water scarcity, in combination with high population density, increase the threat of domestic armed conflicts. Diehl and Gleditsch (2001) concluded that conflict is more likely when high population growth combines with land scarcity. Bruckner (2010: 535–550) studied 37 Sub-Saharan countries between 1981 and 2004 and found that a 5 per cent increase in population growth rate raises the threat of civil conflict by around 6 per cent. Consistent with the notion that population contributes to conflict, Acemoglu, Fergusson and Johnson (2019: 1566) concluded that large population increases in many developing countries after 1940 contributed to an increase in internal violent conflicts, including violent protests and civil wars.

Crimes such as homicides, abductions and kidnapping are more likely to occur in African countries like Nigeria that have had rapid population expansion (Gbaka et al., 2024: 2). Gbaka and his colleagues suggest that such growth can strain resources, potentially resulting in conflict and poverty. He points out that this phenomenon becomes particularly pertinent in the context of Nigeria, where burgeoning population growth intersects with various socioeconomic and security challenges (Gbaka et al., 2024: 2, 13). He concludes that the recuring incidents of unrest, insurgency and elevated crime rates seem to be linked to the growing population and unemployment, suggesting a possible correlation between population growth and insecurity, and that population growth affects insecurity in the long run. This finding is consistent with previous ones, according to which recent unrest, insurgency and high crime rates in Nigeria appear to be rooted in expanding population and unemployment. This hints at a potential relationship between population growth and insecurity (Iwu, 2020: 58–68). Sakanko and David (2018: 77–90) also noted that as Nigeria experiences rapid population growth, there is a heightened demand for resources, including food, jobs, housing and essential services. If these resources are not adequately provided, it can lead to increased inequality and competition, potentially fuelling conflicts.

Population and violent extremism

Over the last decade, the global landscape of violent extremism has dramatically shifted, as violent activity expanded from the Middle East and North Africa to Sub-Saharan Africa (UNDP, 2023: 14). Worldwide deaths from terrorism have fallen

by over one-third globally since peaking in 2015, mainly following the decline of ISIS in Iraq and Syria (IEP, 2022: 29), but attacks in the Sub-Saharan region have more than doubled since 2016 (IEP, 2022: 2) and deaths from terrorism in this region have risen tenfold since 2007 (IEP, 2022: 29). Now, with almost half of all terrorism deaths globally, Sub-Saharan Africa has emerged as the new global epicentre of violent extremism. Countries involved include Somalia, Burkina Faso, Niger and Mali (UNDP, 2023: 14). Other traditional hotspots are Cameroon, Chad and Nigeria, but violent extremist activity is spreading further across the continent, from southern Africa, notably Mozambique, to coastal regions of West Africa, such as Benin and Togo (UNDP, 2023: 48). Its spread has devastating impacts on lives and livelihoods and on prospects for security and development (UNDP, 2023: 14). But as António Guterres, the United Nations Secretary-General, warned in his 2022 remarks to the High-Level Meeting on the Sahel: 'The effects of terrorism, violent extremism and organised crime will be felt far beyond the region and the African continent' (UN, 2022).

Economic pressures, poverty and a lack of employment are cited as central drivers of extremism (UNDP, 2023: 21). Violent extremist groups recruit others by luring them in with the hope of employment, for instance 25 per cent of voluntary recruits cited 'employment opportunities' as their primary reason for joining, particularly among male respondents (UNDP, 2023: 17). Half of these recruits in Niger cited climate change-related difficulties as one of their reasons for joining violent groups (UNDP, 2023: 51). However, while climate change is disrupting subsistence and livelihoods to a limited and localised extent, population growth is rendering young adults landless, jobless and food-insecure at a much greater rate (Hall et al., 2017).

Population and forced migration

Insecurities such as climate-change induced extreme weather events and catastrophes, food insecurity, water scarcity, unemployment, poverty, social conflicts and violent extremism, have all contributed to escalating displacement and migration of people, dwarfing the scale of activity during World War II. The largest proportion of displacement has taken place in Nigeria, Somalia and the Central African Republic (UNDP, 2023: 7) and Syria (Idris, 2013: 394–395). But worse is still to come. By mid-century, today's flow of migrants will seem like a trickle compared to tsunamis of involuntary migrants forced by increasing population

pressure and deteriorating environments to move elsewhere, seeking refuge and solace in more stable states. This move will represent security threats for countries of departure, countries of passage and countries of arrival.

While countries, such as Australia, Canada or the United States, are surrounded by ocean buffers, Europe, with its close proximity to Africa, its land bridge to the Middle East and its neighbourly status with politically volatile nations to the East, will feel these pressures first and foremost. Given that recent sharp rises in migration have led to the rise of anti-immigration political parties, there are reasons to believe that Western societies will respond with further restrictions and bans on both legal and illegal immigration, as well as security measures such as walls, border-patrolling drones and troops and with more authoritarian styles of governing. Meanwhile, a widening gap between the rich and the poor within those already vulnerable Western countries will push society towards instability from the inside (Nuwer, 2017). Thomas Homer-Dixon warns that the more dissatisfied and afraid people become, the more they will tend to cling to their in-group identity – whether religious, racial, or national – leading to further insecurities. In an interview with Rachel Nuwer he said, 'You're setting up the psychological and social prerequisites for mass violence'. When violence finally breaks out, or another country or group decides to invade, collapse will be difficult to avoid. There is a risk that democratic, liberal governance will fail, while stronger autocratic governments will be the 'winners' (Ibid, 2017).

The need for reproductive ethics (of smaller families)

As shown, a rise in population causes or worsens many environmental and socio-economic problems and security threats, including food security, water scarcity, pandemic emergence, climate-change induced extreme weather events and catastrophes, unemployment, poverty, crime, social conflicts, violent extremism and terrorism, wars and forced migration. Attempts to target these separate proximal threats while ignoring the population factor are not strategic and will not solve the security crisis long-term. Population growth is an underlying exacerbator of all the aforementioned security threats. Ending population growth is not sufficient to avoid the many threats already in train, but it is an essential prerequisite for diminishing the emergence of new threats and beginning to mitigate existing stressors. Decreasing reproduction, thus fertility and population, will increase security, not only national but also human and environmental. Beyond

security, it is vital for achieving sustainability and most of the United Nations Sustainable Development Goals (Greguš, 2023: 190–199).

Voluntary limiting of childbearing is the most ethical option. Individuals might limit childbearing from essentially selfish motives, considering the costs and lifestyle constraints associated with raising children, or through concern for their children's best interests; or they might have wider ethical motives for the good of future humanity and the rest of the species with which we share our planet. The reproductive ethics of small(er) families respects a maximum of two children per family, i.e. replacement level, to avoid worsening the situation, while one or none can be seen to make a positive contribution to restoring ecological balance.

While some consider it immoral to discourage people from reproduction, the reality is precisely the opposite. It is immoral to close our eyes to environmental degradation and security threats that human reproduction causes. The more people in general, the more young men in particular, the more threats to security. Targeting population by embracing voluntary reproductive restraint is the most ethical way.

The need for contraception and empowerment

Reproductive ethics of small(er) families, however, are not going to work without specific tools such as, contraception, family planning methods and services. It is important to highlight that this should be *voluntary* family planning, because it is about responding to what women (and men) want, not telling them what to do. However, because traditions around family size and the roles of women are resistant to change, it is not enough merely to ensure access for those who ask for it. When population growth poses so many threats to the future security of parents and their children, promoting the benefits of smaller families, so that people can make informed decisions, is no less than a duty of care.

The World Health Organisation estimated in 2021 that 164 million women have an unmet need for contraceptive services (WHO, 2021). They are aged 15–49 and want to avoid pregnancy. Many studies show that fertility remains high where there is a significant unmet need for family planning. Access to family planning has a powerful impact on birth rates. Family size falls when people have the knowledge, means and motivation to prevent unwanted pregnancies. Without

contraception, which separates sexual intercourse from childbearing, the default position in any heterosexual partnership is a large family (Potts et al., 2015: 508).

Children in small families are more likely to enter school and stay in school than children in large families (Knodel, 1990: 31–62). In countries where the birth rates have fallen, children graduating from school are more likely to be employed as adults. As such, voluntary family planning not only allows women to obtain autonomy and control over their bodies and their lives, but it simultaneously allows societies to seek economic prosperity. Widespread, effective and voluntary use of contraception is an essential factor and the most ethical vehicle not only to achieve ecologically sustainable human societies, but also to raise world living standards.

Hence, in all the ways discussed above, contraception contributes to world peace and security (Potts et al., 2015: 509). Potts gets it right in the title of his paper 'The pill is mightier than the sword' (Potts, 2006).

To address the persistent unmet need for family planning, it is necessary to find sufficient political will and funding to ensure affordable access to contraception to all, and to build public acceptability of small family ideals (Greguš and Guillebaud, 2023: 589–597). It is not only ethical and pragmatic, it is also *cost-effective*. According to the Copenhagen Consensus, for every US dollar spent on contraception the return on investment is $120 (CCC, 2015).

Finally, and importantly, the education and empowerment of girls and women plays a valuable role in security. It is stated that women's empowerment is fundamental for peace (UKFAC, 2014). Also, Hudson and colleagues (2009: 38–39) state that measures of the 'the physical security of women [in a society] is strongly associated with the peacefulness of the state'.

The need for long-term thinking

Given that population is a long-term issue, what is necessary is long-term thinking. Short-term thinking only causes short-term relief. It deals with the problems, not the origins of the problems, extinguishing fires instead of preventing them from starting. As such, governments need to embrace the same long-term thinking in security as doctors do in preventive medicine (of which family planning is a

prime example). The goal of preventive medicine consists of prophylaxis, i.e. in prevention of new problems and diseases. It has long held that it is better to prevent diseases from emerging than curing them as they appear. It is more effective, and cheaper, than treatment, but it is also superior ***ethically***, in that it reduces human suffering by preventing diseases in the first place (Greguš, 2022).

Likewise, a similar, far-reaching paradigm shift is required in security. It entails moving us from viewing security threats as security problems *only*, to take a more holistic view, with a focus on addressing underlying causes of security threats and adopting a preventative approach. As an essential ingredient in the cocktail of tensions and triggers behind almost all security threats, human population growth is the primordial problem. Governments cannot ensure future security if they ignore the need for population stabilisation.

Between the 1930s and the 1970s and especially during the so-called Green Revolution, humanity invested enormous resources into increasing agricultural production. Due to high-yielding crops, new chemical fertilisers, synthetic herbicides and pesticides, agricultural production manifoldly increased. However, the 'Father' of the Green Revolution and Nobel Laureate Norman Borlaug was not as optimistic as the mainstream media was in praising the success of the Green Revolution. At the end of his 1970 Nobel Lecture, he said: 'The Green revolution has won a temporary success in man's war against hunger and deprivation; it has given man a breathing space. If fully implemented, the revolution can provide sufficient food for sustenance during the next three decades. But the frightening power of human reproduction must also be curbed; otherwise the success of the Green Revolution will be ephemeral only. Most people still fail to comprehend the magnitude and menace of our burgeoning population' (The Nobel Prize, 1970). While international efforts for voluntary family planning gathered momentum during the 1970s, they were gradually disenfranchised from the mid-1980s and especially since the 1994 International Conference on Population and Development in Cairo (Campbell and Bedford, 2009). And so, the tide of food insecurity appears to be flowing once more (WHO, 2025).

Worse, short-term reactive thinking prevails. It can be viewed in the case of combating terrorism. Since the 11 September 2001 attacks in the United States, security-driven militarised responses prevailed, having been shaped by

the discourse of the global 'War on Terror'. However, 15 years later, the United Nations in its 2016 Plan of Action to Prevent Violent Extremism acknowledged that the traditional 'single-minded focus only on security measures and an utter disregard for human rights have often made things worse' (UN, 2016). The plan highlighted the importance of development approaches.

By 2021, the world's military spending reached its highest level since the end of the Cold War (SIPRI, 2022: 1). In Sub-Saharan Africa, it increased greatly (SIPRI, 2022: 5–6), and counter-extremism initiatives in Africa achieved some initial success. Still, extremist groups continue to expand in the continent and have devastating impacts across much of Sub-Saharan Africa. To prioritise prevention over security-driven responses, funding that is disproportionally allocated towards militarised capacities needs to be reallocated to mitigate the conditions that give rise to violent extremism, including the population factor. Just as in the case of contraception, it is not only pragmatic but also cost effective. Evidence shows that every US dollar invested in prevention and peacebuilding activities can reduce the cost of conflict and violent extremism by sixteen dollars long-term (UNDP, 2020: 9). Projected forward from 2017 to 2027, this outlay would save US$2.94 trillion in direct and indirect losses from conflict (IEP, 2016: 3), not to mention the human suffering and premature deaths avoided.

From 2007 to 2016, total security spending was estimated to be US$838 billion in Africa, corresponding in absolute terms to almost US$84 billion per year (UNDP, 2020: 1–5). Fully funding family planning and reproductive health services globally would cost less than a quarter of that amount (Sully et al., 2020), and would do much more in contributing to a sustainable future, security and stability.

Ultimately, long-term thinking also helps us to realise that the threats to security that humanity faces today, and will face in the future, are planetary in scale. Insecurity crises, whether from violence, disease or deprivation, are felt far beyond the regions of origin. For this reason, it is essential to put emphasis on placing human and environmental security ahead of national security. Security is no longer a matter for specific countries or regions, but one that humanity as a whole must (ethically) respond to.

Conclusion

Without arresting human population growth, there can be no long-term, global security. Security experts and policymakers must pay more attention to the reproductive ethics of small(er) families, the need for increased availability and access to contraception, women's education and empowerment and long-term thinking. Only then can humanity as a whole achieve security, not just for some privileged states (or groups of populations), but for all regions, countries and demographic groups of the world. Now and in the future.

Greater investments into promotion of reproductive ethics of small(er) families, into increased availability of all family planning methods and services, including safe abortion, education and empowerment of women, are essential. They are not only ethical, but they are long-term solutions and cost-effective, thus pragmatic and strategic measures to achieve security.

Dedication

In memory of Malcolm Potts (1935–2025), the author of *Sex and War* and *The Pill is Mightier than the Sword*, whose well-lived life and devotion to international reproductive health and family planning, as well as the future of life on planet Earth, has been an inspiration to many.

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RESEARCH ARTICLE

Wheelbarrow motion theory: Climate change and corruption as interdependent drivers of irregular South-to-North migration – practical solutions and policy responses

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Abstract

Irregular migration from the Global South to the Global North has increased alongside intensifying climate stress and persistent governance failure. Existing migration frameworks often examine environmental pressures and corruption separately, limiting their capacity to explain sustained irregular migration and the limited effectiveness of deterrence-based policies. This article proposes the Wheelbarrow Motion Theory to explain how climate stress and corruption interact to generate and sustain irregular migration. A critical narrative review was conducted using peer-reviewed literature, multilateral agency reports and policy evaluations published between 2000 and 2025, with empirical illustrations drawn from Africa, Latin America and South Asia. The review shows that climate stress erodes livelihoods and coping capacity, while corruption weakens adaptation, distorts relief delivery and restricts lawful mobility pathways. When these forces interact, displacement becomes structural and resistant to containment through border enforcement alone. Predominant policy responses centred on securitisation, deportation and migration externalisation have rerouted rather than reduced migration flows. Irregular migration is best understood as the

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outcome of interacting climate and governance failures rather than isolated drivers. Effective mitigation requires integrated approaches that combine climate adaptation, governance reform and expanded legal mobility options, rather than deterrence-centred strategies alone.

Keywords
climate change, corruption, irregular migration, governance failure, displacement, Wheelbarrow Motion Theory.

Introduction
Migration is the movement of persons away from their places of usual residence either across an international border or within a state (International Organization for Migration, 2019). It results from individual decisions shaped by unique circumstances, goals and the broader context in which people choose to relocate (Abel et al., 2019). Climate change has emerged as one prominent factor shaping both regular and irregular migration patterns in recent decades. The International Organization for Migration (IOM) defines climate migration as 'the movement of a person or groups of persons who, predominantly for reasons of sudden or progressive change in the environment due to climate change, are obliged to leave their habitual place of residence, or choose to do so, either temporarily or permanently, within a State or across an international border' (IOM, 2019). Migration is irregular when it occurs outside the legal frameworks applicable in the involved countries (Fontana, 2024; Almulhim et al., 2024).

Global South nations, notably Africa, struggle to mitigate climate consequences, deploy technological solutions and build resilient infrastructure. Without action, climatic stress causes protracted droughts, floods, excessive temperatures and landslides, driving migration (Batista et al., 2024). Climate change drives irregular migration, notably to the European Union (EU) (Fontana, 2024). The 2020 global displacement rate was 40 million, with 30 million directly affected by natural disasters (Almulhim et al., 2024). Social deterioration suppresses migration until critical thresholds are crossed, then migration occurs abruptly (Abel et al., 2019). Governance failings exacerbate these dynamics, sustaining Global South–to–North migratory patterns (Adams, 2015). Importantly, violence, economic instability and corruption influence migration decisions more than climate change, making safe and orderly mobility difficult (Younis, 2022; Almulhim et al., 2024).

The combined pressures of climate change and corruption increasingly undermine local coping systems and restrict lawful mobility options in climate-vulnerable regions. Corruption in public institutions that fail to manage resources, assist adaptation or provide relief increases migration pressure in communities affected by droughts, floods, environmental degradation and livelihood disruption (Adams and Kay, 2019). International organisations such as the UNDP, World Bank and Transparency International have sought to address these dynamics through anti-corruption frameworks, governance reform programmes and climate finance safeguards. However, these interventions have often been fragmented, insufficiently coordinated and limited in reach, leaving significant governance vacuums that sustain migration pressure. Climate stress and corruption are major push factors in the neoclassical push-pull framework (Lee, 1966), but it does not fully reflect their interaction. Living with corruption increases emigration and climate vulnerability, according to empirical studies (Maara and Maydom, 2024; Schran, 2021). Building on this gap, the Wheelbarrow Motion Theory, introduced in this study, conceptualises irregular migration as forward motion generated by the joint and reinforcing forces of climate stress and corruption. When these forces operate together, migration accelerates and becomes resistant to containment through border controls alone. Drawing on a critical synthesis of empirical and policy literature, this framework explains how environmental shocks filtered through weak governance structures produce sustained migration patterns that single-factor explanations fail to capture.

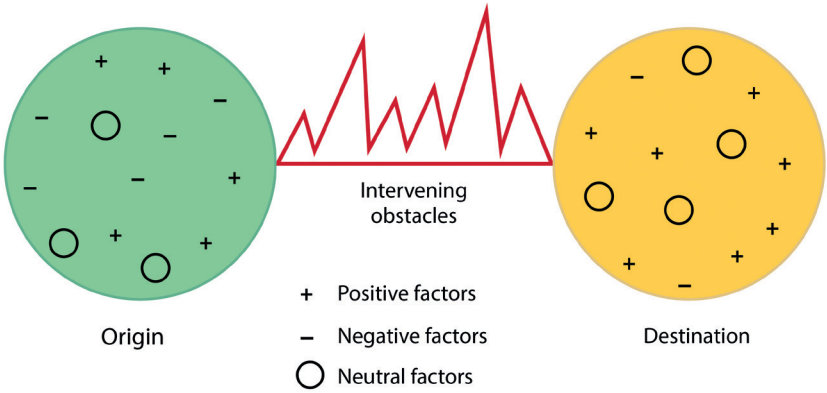
This study adopts a critical narrative review. It synthesises peer-reviewed articles, multilateral agency reports and policy analyses published between 2000 and 2025. Sources were identified through structured searches of Google Scholar, Scopus and Web of Science using keywords related to climate change, corruption, governance failure, irregular migration and displacement. Grey literature from the International Organization for Migration (IOM), the United Nations Development Programme (UNDP), the Food and Agriculture Organization of the United Nations (FAO), the World Bank (WB) and the Office of the United Nations High Commissioner for Refugees (UNHCR) was included to capture policy dynamics and empirical trends often absent from academic journals. Studies were selected based on their explicit linkage of environmental stress, governance or corruption, and migration outcomes, with single-factor analyses excluded. Thematic synthesis was used to identify cross-regional patterns, which were interpreted through the Wheelbarrow Motion Theory.

Theoretical framework

Lee's Push-Pull theory of migration

In 1966, Everett Lee created a migration theory that states that people move because of push and pull factors in their home country and the new region. According to this theory, economic hardship, conflict and harsh environment drive people away (Saraswati et al., 2025). Better jobs, security and living circumstances attract them to the new location. In migration research and policy, Lee's thesis has helped shape government immigration and refugee policies (Faridi, 2018). This theory, thus, helps to explain how climate change and corruption serve as push factors for migrants from the Global South to the Global North. Figure 1 presents a migration model adapted from the Push-Pull Theory.

Figure 1. Push-Pull Migration Model



SOURCE: ADAPTED FROM LEE'S (1966) PUSH-PULL THEORY OF MIGRATION

Push factors driving emigration from origin countries include climate shocks, environmental degradation, poverty, political instability, corruption and limited livelihood opportunities. Pull factors attracting migrants to destination countries include economic opportunity, political stability, better public services and stronger institutional frameworks. Intervening obstacles such as border controls, visa restrictions, travel costs and social networks further shape the direction and scale of migration flows.

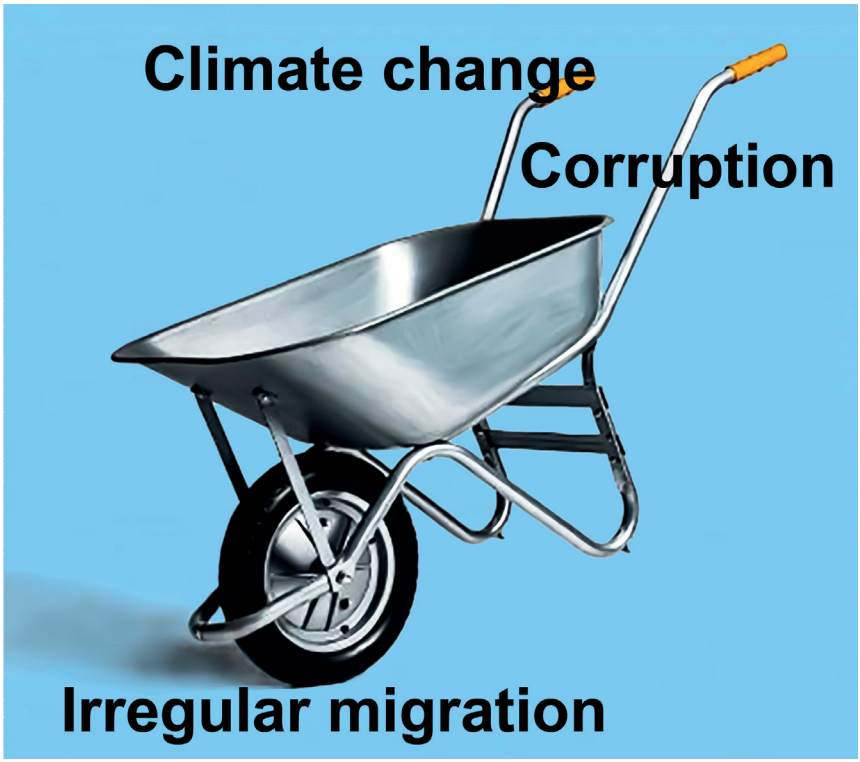
Migration streams and counter-streams are created by push and pull factors in the areas of origin and destination; at the same time, intermediary barriers like travel expenses and border regulations prevent migration. Over time, there is a tendency for human mobility to rise, and migrants are more likely to relocate to areas where friends or family already live. The selective nature of migration means that certain individuals (like young people or men) are more inclined to relocate than others, depending on the situation. Lastly, economic interests usually take precedence. All of these components can be influenced by environmental circumstances (Sherbinin, 2020). Climate change and corruption exacerbate existing push factors by serving as accelerants, stressors, and multipliers (Cottier and Salehyan, 2021; Fontana, 2024).

While Lee's framework provides a foundational lens for identifying climate change and corruption as push factors, it treats these drivers as additive and static, limiting its explanatory power in contexts where multiple stressors interact dynamically. The Wheelbarrow Motion Theory, introduced in this article, builds directly on this foundation by reconceptualising climate stress and corruption not as independent push factors but as mutually reinforcing forces that generate sustained migration momentum – a dynamic interaction that push-pull theory alone cannot capture.

Theoretical contribution: The Wheelbarrow Motion Theory

Building on Lee's (1966) push–pull theory, this article advances the *Wheelbarrow Motion Theory (WMT)* to explain why irregular Global South-to-North migration accelerates under contemporary conditions. In push–pull theory, climatic stress and corruption are drivers, but they act in simultaneous or additive ways. On the other hand, WMT views them as joint propulsion systems that generate momentum. Climate change and corruption are like the two handles of a wheelbarrow: when both work together, displacement is swift and persistent; when any of these fail, mobility slows (Figure 2).

Figure 2: The Wheelbarrow Motion Theory



SOURCE: CREATED BY AUTHOR

The Wheelbarrow Motion Theory (WMT) provides a conceptual and metaphorical framework for analysing irregular South-to-North migration as a dynamic outcome of interacting structural forces in the twenty-first century. It conceptualises migration not as a linear response to isolated pressures but as a process driven by the synergistic interaction between climate stress and governance failure, with corruption emerging as a particularly influential manifestation of the latter. The theory responds directly to the limitations of traditional push–pull models, which, while useful for identifying migration incentives, treat drivers as additive and static (Lee, 1966). Such models struggle to explain contemporary climate-related displacement, where environmental pressures are mediated through political, institutional and governance contexts, risking environmental determinism by underplaying these interactions (Puma et al., 2022).

In the wheelbarrow metaphor, irregular migration is likened to the forward motion of a wheelbarrow moving over uneven terrain. This motion requires two handles to be actively pushed. The first handle represents climate stress, while the second represents governance failure, with corruption standing out as a dominant and forceful driver. Climate stress alone does not inevitably produce migration, nor does corruption in isolation. Significant and sustained migration flows emerge primarily when both handles are engaged simultaneously, reinforcing one another and generating momentum that exceeds the capacity of downstream controls.

The metaphor clarifies the components of this process while acknowledging its analytical boundaries. In the Wheelbarrow Motion Theory, sustained forward movement requires the concurrent operation of two forces. Much like a wheelbarrow that cannot be pushed with a single handle, persistent irregular migration is most likely to emerge when climate stress and governance failure act together. Either force on its own may produce pressure, immobility or short term displacement, but durable and large scale irregular migration tends to arise when environmental stress intersects with weak governing systems that are unable to protect livelihoods, manage risk or provide lawful mobility pathways.

Governance failure is treated here as a broad structural condition encompassing weak institutional design, poor policy coordination, limited administrative capacity, ineffective resource allocation and inadequate information systems. Within this wider condition, corruption is examined as a salient and empirically observable mechanism through which governance failure manifests, particularly in climate vulnerable contexts. Corruption undermines adaptation planning, diverts relief resources, distorts land and aid allocation and erodes trust in public institutions, thereby translating climate stress into migration pressure.

Within the metaphor, the bed or tray of the wheelbarrow represents Global South contexts where these pressures accumulate. The wheel represents migratory flux, including scale, speed and direction. Drawing on the aspirations–capabilities framework, affected populations retain agency through aspirations and capabilities shaped by resources, networks, and mobility infrastructure. Movement occurs as the wheelbarrow advances across institutional frictions at origin and destination.

WMT highlights three core dynamics. The first is synergy: a multiplicative interaction between climate stress and governance failure. Desertification, soil salinisation and sea-level rise, as well as droughts, floods and cyclones, all undermine livelihoods and adaptive ability (IPCC, 2022). Governance failure, particularly bribery, embezzlement, elite capture, nepotism and clientelism, diverts climate finance, weakens adaptation and reconstruction, distorts land and aid allocation, and undermines institutional trust (Olken and Pande, 2012; Transparency International, 2025). Higher perceived corruption is linked to increased emigration, especially among those with the financial and social resources to migrate (Poprawe, 2015; Arif, 2022).

The second dynamic is momentum. Once migration begins, it becomes path dependent. Migrant networks, remittances and smuggling economies reduce costs and risks for subsequent movers, sustaining and accelerating flows over time. The third dynamic is resistance. Border controls, visa regimes and securitisation policies introduce friction but rarely halt movement outright. Instead, they tend to reroute flows, increase risks and intensify irregularity without addressing underlying drivers (World Bank, 2023c). These dynamics are formalised through the migration momentum function:

$$M \approx (C \times G) / (A + R)$$

where *M* denotes migration momentum, *C* represents climate stress, *G* captures governance failure intensity, *A* reflects institutional and adaptive capacity, and *R* represents regulatory and border resistance. The multiplicative term $(C \times G)$ captures the core theoretical claim that climate stress and governance failure reinforce one another rather than acting independently. High climate exposure combined with weak governance produces disproportionately strong migration pressure relative to single-factor contexts. Conversely, stronger adaptive capacity or effective regulation can dampen momentum, though rarely eliminate it entirely.

Within this formulation, adaptive capacity reflects the ability of institutions and communities to absorb shocks through effective governance, infrastructure, and social protection, while resistance captures policy-induced barriers along migration pathways. Importantly, momentum does not imply universal

movement. Agency introduces selectivity, as only those with sufficient aspirations and capabilities are able to act on migration opportunities. WMT accommodates other migration drivers such as conflict, economic opportunity and family ties but places the climate–governance nexus at the centre of analysis. Empirical patterns in regions such as the Horn of Africa and the Sahel, the Northern Triangle of Central America, and South Asia illustrate how recurrent climate shocks combined with governance weaknesses translate local crises into sustained irregular migration.

Push and pull factors shaping irregular migration

Climate stressors and mobility pressure

Over the past century, global climate patterns have shifted markedly, increasing the frequency and intensity of extreme events such as droughts, heat waves and hurricanes (Sherbinin, 2020). The Intergovernmental Panel on Climate Change predicts a 0.5°C global temperature rise between 2030 and 2052, affecting habitability and livelihoods. Such changes cause widespread social and economic upheaval because climate conditions underpin most economic activity (Shah, 2021). Climate change's effects on agriculture, water and infrastructure in poor nations have drawn scholars, policymakers and advocacy groups' attention to its role in migration (IOM, 2009; Sherbinin, 2020). Therefore, climate-related displacement is a current risk. Climate change was a major element in the 2016 Paris Agreement discussions and is closely linked to migration from sub-Saharan Africa to Europe and from Central America to the United States.

Historical evidence further confirms the link between climate variability and population movements. Climatic stress contributed to the decline of the Mayan Empire, influenced migration following the fall of the Western Roman Empire and facilitated the Mongolian westward expansion under wetter steppe conditions (Büntgen and Di Cosmo, 2016). More recent examples include the American Dust Bowl of the 1930s and the Sahelian droughts of the 1970s and 1980s, where declining land productivity undermined population support systems (Sherbinin, 2020). To explain these patterns, the IPCC has advanced a risk framework linking climate hazards to social vulnerability. Migration likelihood increases when hazards intensify and adaptive capacity remains limited, shaped by sociodemographic factors and access to resources (Sherbinin, 2020; Beyer et al., 2023).

Table 1. Types of Climate Events and Associated Migration Outcomes

Category	Examples	Nature of Change	Likely Migration Outcome
Fast-onset events	Floods, storms, heat waves, rapid drought episodes	Sudden and extreme climatic shocks	Short-term displacement, with eventual return to origin areas; repeated shocks may trigger long-term movement
Slow-onset events	Gradual temperature rise, long-term rainfall variation, acidification, glacial retreat, soil salinisation, land and forest degradation, biodiversity loss, desertification	Progressive and cumulative environmental deterioration	Permanent migration or planned relocation as livelihoods and habitability decline

Corruption and institutional breakdown

The UNDP recognises that climate change is a serious challenge to sustainable development, and that the most devastating results will be for poor people in poor countries in the global south. Consequently, the international community has pledged large amounts of money to mitigate the effects in developing countries. It is therefore critical that these funds are spent effectively and do not fall prey to corruption. Corruption is defined by UNDP (2008) as the misuse of entrusted power for private gain and manifests in multiple forms that shape governance outcomes and mobility decisions. These include bribery, embezzlement, fraud, extortion, nepotism, patronage, cronyism, clientelism, political corruption, grand corruption and state capture, all of which distort public decision-making and resource allocation (UNDP, 2010).

In climate-vulnerable contexts, corruption undermines climate finance by diverting funds from intended beneficiaries, weakening institutional capacity and eroding adaptation and mitigation efforts. These effects disproportionately burden vulnerable groups, including women and Indigenous communities, while sustained corruption erodes donor confidence and public trust, increasing migration pressures (Malaj and Firza, 2023). Corruption also directly facilitates

irregular migration where legal pathways are limited, operating across origin, transit and destination stages through bribery, exploitation and gendered abuses such as sextortion (Poprawe, 2015; Merkle et al., 2020; Bernini et al., 2023; Baškot et al., 2025).

The combined effect of climate stress and corruption on irregular migrations

Climate change is simply one aspect in migration decisions, which are influenced by environmental, economic, social and political reasons (Sherbinin, 2020; Fontana, 2024). Alongside these pressures, corruption drives and facilitates migration across origin, transit and destination settings, affecting resources, institutions and mobility channels (Merkle et al., 2020). The push–pull paradigm can identify climate stress, corruption and relative stability as push and pull factors, but it cannot explain how these forces interact or why migration accelerates under specific conditions. The Wheelbarrow Motion Theory bridges this gap by viewing climatic stress and corruption as interconnected causes that drive migration. Corruption hinders adaption mechanisms, hurts relief and recovery efforts, and limits legal mobility as climate stress erodes livelihoods and increases risk. These forces exert pressure on the migration process, perpetuating irregular movement even with single-factor interventions. When climatic stress and corruption limit legal options, irregular migration becomes sensible. Institutional, social and demographic factors influence route selection, with climate change and corruption as contributing factors (Baškot et al., 2025; Fontana, 2024). Corruption hinders access to adaptation programs, humanitarian aid, land rights and financial services, reducing the effectiveness of local coping strategies like income diversification or state support (Malaj and Firza, 2023; Maara and Maydom, 2024). Due to exorbitant expenses, tight visa regimes and limited employment quotas that many climate-affected populations cannot achieve, legal migration options remain mostly inaccessible (Malaj and Firza, 2023). Intermediaries use institutional weakness to raise prices and block formal routes. Thus, climate hardship and corruption drive irregular migration as the best alternative under constrained choice.

Critical analysis of irregular migration cases from the Global South

Horn of Africa

Across the Horn of Africa, including Somalia, Ethiopia, Kenya, Eritrea, South Sudan and Djibouti, irregular migration reflects a shared structural condition

rather than isolated national crises. The region faces recurrent droughts, floods and ecosystem degradation alongside persistent governance failure, producing displacement that is increasingly durable and strategic rather than episodic (UN OCHA, 2023; FAO, 2024). Within the Wheelbarrow Motion Theory, climate stress and corruption operate as reinforcing forces that jointly generate migration momentum. Climate shocks erode livelihoods and household coping capacity, while corruption weakens adaptation systems, distorts relief delivery and undermines institutional trust, accelerating movement among those able to migrate.

Somalia illustrates this connection. The greatest drought in forty years caused by five consecutive failed rainy seasons since 2020 left over 6.6 million people food insecure by late 2023 (FAO and WFP, 2023). Humanitarian aid corruption, including diversion and inflated beneficiary lists, exacerbated livelihood collapse and drove irregular migration to Yemen and the Gulf (Transparency International, 2022). Since 2019, droughts, floods and violence in Ethiopia have uprooted farming and pastoral populations. Corruption in emergency procurement and politicised aid allocation caused approximately 4.5 million IDPs, many of whom migrated to Sudan and Libya (World Bank, 2023b; UNHCR, 2024). In northern Kenya's arid counties, protracted drought and county-level corruption hampered assistance delivery and resilience, pushing youngsters toward irregular pathways (Mwangi and Kramon, 2022; Maara and Maydom, 2024). Climate stress, elite capture and institutional disintegration cause large-scale displacement in Eritrea, Djibouti and Sudan (Böhmelt, 2025) African Development Bank (AfDB), 2022; UN OCHA, 2024). These cases show how the Wheelbarrow Motion Theory's climate-governance nexus generates region-wide migration momentum that single-factor explanations cannot.

West and Central Africa (Sahel Region)

The Sahel, stretching across Mauritania, Mali, Burkina Faso, Niger, Chad, northern Nigeria and parts of Cameroon, represents one of the most structurally exposed zones to the combined pressures of climate stress and institutional fragility. Since 2020, persistent rainfall loss, rising temperatures, desertification and recurring droughts have increased food insecurity and harmed farming and pastoral livelihoods (FAO, 2023b; IPCC, 2022). Land degradation, dwindling water sites and fewer grazing lands have damaged agro-pastoral systems that traditionally

absorbed climatic shocks through seasonal mobility. Climate-induced livelihood collapse is strongest in Niger, Mali and Burkina Faso (World Bank, 2023a). As households incorporate movement into risk diversification, crop failure, livestock death and soil infertility have upended rural production systems and survival methods. Due to corruption, arms trafficking and extremist groups are widespread, making conditions even worse for people affected by climate change (International Crisis Group, 2023; Transparency International, 2022). Furthermore, State officials and security commanders in countries like Burkina Faso and Mali have been accused of protection rackets, illicit mining taxation and humanitarian aid diversion (Idris et al, 2022).

The Sahel is a major feeder zone for irregular migration to Libya, Algeria, Tunisia and Europe. Climate stress drives rural people to transit hubs like Agadez, Gao and northern Chad, where migrants join trans-Saharan smuggling networks protected by corrupt officials (IOM, 2023a; UNODC, 2022a). Bribery allows people trafficking to coexist with formal security operations at borders. Due to drought-driven displacement and war, irregular movement becomes structural rather than episodic, with the Sahara becoming a sustained region of vulnerability characterised by extortion, forced labour and violent control by trafficking groups.

Latin America (Northern Triangle)

The Northern Triangle of Central America, comprising Guatemala, Honduras and El Salvador, is among the most climate-exposed and institutionally fragile migration producing regions globally. Intensifying climate extremes, including severe hurricanes, recurrent droughts linked to El Niño, deforestation and soil degradation, have weakened subsistence agriculture and rural livelihoods (IPCC, 2022; FAO, 2023a). Hurricanes Eta and Iota in 2020 displaced nearly seven million people and damaged key agricultural zones in Honduras and Guatemala (UN OCHA, 2021). By 2023, prolonged droughts in the Dry Corridor had driven crop failure and food insecurity, affecting almost nine million people (FAO and WFP, 2023). These pressures are compounded by corruption that undermines adaptation and recovery through distorted procurement, clientelist relief distribution and weak regulation of land and extractive projects (Transparency International, 2022; World Bank, 2022). Migration to the United States thus reflects environmental loss interacting with institutional failure rather than climate stress alone (IOM, 2023b; UNODC, 2022b).

South Asia

South Asia, especially Bangladesh and Pakistan, is one of the most populous and climate-exposed regions. Overlapping cyclones, monsoon flooding, river erosion, glacial melt, heat waves and saline intrusion impact agriculture, fisheries and urban livelihoods (IPCC, 2022; World Bank, 2023c). Recurrent cyclones and seasonal floods over the Ganges–Brahmaputra delta, rapid saline intrusion in coastal regions and riverbank erosion displace about 200,000 Bangladeshis yearly (IOM, 2022). Cyclone shelters and early warning systems have expanded; however, procurement fraud and low-quality work in land management, embankment construction and maintenance reduce their effectiveness (Transparency International Bangladesh, 2023). Displaced households move to Dhaka and Chittagong, where informal settlements are becoming staging locations for international labour migration.

Pakistan exhibits parallel dynamics driven by glacial lake outburst floods, monsoon variability and catastrophic river flooding. Over 30 million people were uprooted and nearly one third of agricultural output was destroyed in the 2022 floods (UN OCHA, 2022). Land administration, irrigation management and emergency procurement corruption hampered flood protection and relief delivery, while political elites stole rehabilitation funds (Asian Development Bank, 2026). Maladaptation and institutional failure turn transient displacement into persistent agrarian exodus. Migration brokers exploit this weakness by proposing debt-financed Gulf departure routes under coercive recruitment systems (IOM, 2023a), turning internal displacement into outward migration desires. Table 3 below synthesises evidence from the Horn of Africa, the Sahel, Latin America's Northern Triangle and South Asia. It shows how similar mechanisms operate across diverse ecological and political contexts while producing region-specific migration outcomes.

Table 3. Climate Stress, Corruption Dynamics and Irregular Migration Across the Global South

Region	Country / Sub-region	Dominant Climate Stressors	Key Corruption and Governance Failures	Resulting Migration Outcomes	Key References
Horn of Africa	Somalia	Consecutive failed rainy seasons, severe drought, collapse of pastoral systems, widespread food insecurity	Diversion of humanitarian aid, inflated beneficiary lists, capture of relief by political and armed elites, chronic state fragility	Mass internal displacement and high irregular migration toward Yemen and Gulf states	FAO and WFP (2023); Transparency International (2022); UN (2023); IOM (2024a)
	Ethiopia	Recurrent drought, flooding in lowlands, crop and livestock losses, climate stress intersecting with conflict	Procurement fraud in emergency food supply, politicised aid targeting, weak resettlement accountability	Over 4.5 million internally displaced; increased irregular routes via Sudan and Libya	World Bank (2023b); Jenkins (2024); UNHCR (2024)
	Kenya (Northern Counties)	Prolonged drought, livestock mortality, groundwater depletion, collapse of rain-fed agriculture	Inflated water trucking contracts, ghost beneficiaries, politicisation of drought relief at county level	Rising cross-border irregular migration toward Ethiopia, Sudan, and Libya	Auditor General of Kenya (2023); Mwangi and Kramon (2022); IOM (2023a)
	Eritrea	Long-term water stress, soil degradation, environmental exhaustion	Highly rigid governance structures, absence of adaptive institutions	Persistent outward irregular migration toward Sudan, Ethiopia, and Libya	(Böhmelt, 2025)

Region	Country / Sub-region	Dominant Climate Stressors	Key Corruption and Governance Failures	Resulting Migration Outcomes	Key References
	Djibouti	Sea-level rise, saltwater intrusion, urban drought stress	Elite capture of urban land, corruption in development contracts	Irregular outward migration and transit movement toward Yemen and the Gulf	AfDB (2022)
	Sudan	Flooding, desertification, climate-induced land degradation, armed conflict	Corruption in land administration, manipulation of humanitarian access, institutional collapse	Over 8 million displaced; large-scale external migration toward Libya and Egypt	UN OCHA (2024)
Sahel (West & Central Africa)	Niger	Desertification, declining rainfall, heat extremes	Border bribery, trafficking protection, aid diversion	Major transit hub for Sahara routes toward Libya and Algeria	FAO (2023a); IOM (2023a); Idris et al. (2022)
	Mali	Recurrent drought, soil degradation	Security sector corruption, illegal taxation by armed groups	Internal displacement and trans-Saharan migration	World Bank (2023c); UNDP (2023a)
	Burkina Faso	Rainfall volatility, crop failure	Collusion between militias and officials, diversion of relief aid	Mass rural displacement and youth out-migration	Transparency International (2022); International Crisis Group (2023)
	Chad	Water scarcity, pastoral collapse	Corruption in land administration and security forces	Cross-border migration toward Libya and Sudan	World Bank (2023c)
	Northern Nigeria	Drought, land degradation, shrinking Lake Chad	Insurgent financing networks, corrupt local governance	Mixed climate-conflict displacement toward Niger and Libya	IPCC (2022); UNODC (2022a)

Region	Country / Sub-region	Dominant Climate Stressors	Key Corruption and Governance Failures	Resulting Migration Outcomes	Key References
Latin America (Northern Triangle)	Guatemala	Dry Corridor droughts, hurricanes, floods, crop failure	Land grabbing by extractive elites, corruption in reconstruction contracts	Large-scale rural displacement and sustained migration toward the US	FAO (2023b); World Bank (2022)
	Honduras	Hurricanes Eta and Iota, river flooding, deforestation	Inflated disaster contracts, clientelist relief allocation	Persistent outward migration and post-disaster caravans	UN OCHA (2021); Transparency International (2022)
	El Salvador	Extended droughts, flash flooding, coastal erosion	Politicisation of relief aid, weak municipal adaptation capacity	Youth- and family-based irregular migration toward North America	FAO & WFP (2023); IOM (2023a)
South Asia	Bangladesh	Cyclones, river flooding, salinity intrusion, riverbank erosion	Procurement fraud in embankments, corruption in land administration, politicised relief	Large-scale internal displacement; rising debt-driven labour migration	IOM (2022); Transparency International Bangladesh (2023)
	Pakistan	Monsoon flooding, glacial melt, heat extremes	Corruption in irrigation management, elite capture of reconstruction funds	Protracted displacement and expansion of international labour migration	UN OCHA (2022); Asian Development Bank (2026)

Western policy responses

Existing approaches

Border controls have remained the dominant policy response to irregular migration. Over recent decades, the European Union, the United Kingdom and the United States have expanded enforcement through intelligence sharing, surveillance technologies, intensified patrols, biometric identification systems, e-borders and automated risk profiling, reflecting a broader shift toward securitised migration governance (Oelgemöller, 2017; van Liempt et al., 2023). In this securitised environment, deportation is a key response to irregular migration. Deportation involves apprehension, custody and repatriation, sometimes voluntary but sometimes forced, and a long procedure that often culminates in unsupported reintegration (Ambrosini and Minke, 2023). Evidence suggests that deportation seldom deters future migration and may encourage riskier mobility.

Destination nations increasingly use externalisation techniques beyond direct enforcement. Both bilateral and multilateral agreements aim to expand migration management beyond national borders by working with transit and origin nations. Joint patrols, foreign border force capacity-building, readmission agreements and migration management support are examples (Boas, 2021). The alleged root reasons of migration can be addressed through 'upstream' initiatives. The 2015 Valletta Action Plan and EU Emergency Trust Fund for Africa promoted stability, employment and governance reform in African partner states. These programmes have prioritised security, border control and migrant containment over long-term development, climate adaptation and anti-corruption reform, according to empirical evaluations (Boas, 2021).

Humanitarian protection, limited legal migration and voluntary return and reintegration programmes are also used, but in small amounts. Current policy solutions are scattered and enforcement-heavy, failing to address the underlying link between climate stress and government failure that maintains irregular migration. Upstream measures also include agreements with third countries to block migration routes. The 2016 EU-Turkey deal and cooperation with Libya sharply reduced Mediterranean crossings. Yet these arrangements have been criticised as externalising migration control. Reports by Human Rights Watch (2019) documented severe abuses in Libyan detention centres, including overcrowding, poor sanitation, inadequate healthcare and systematic violence against migrants. Figure 3 shows the deteriorated conditions in the Libyian detention centres.

Figure 3. Detention conditions of migrants in Libya

SOURCE: HUMAN RIGHTS WATCH CC BY-NC-ND 4.0 (2019)

The European Union's migration agreements with Libya have contributed to a reduction in Mediterranean crossings, often framed as a short-term political success. However, this outcome has come at significant long-term cost, including the entrenchment of violent actors, the weakening of state accountability and heightened risks to migrant safety (Abebe, 2019). Extensive evidence documents the widespread use of arbitrary detention, ill treatment and sexual violence against migrants held in Libyan facilities, particularly within detention centres linked to migration control arrangements (Ambrosini and Minke, 2023). Rather than directly attributing responsibility to specific donor funding streams, existing research highlights how externalisation strategies shift migration control to fragile contexts with limited oversight, thereby increasing the likelihood of systematic abuse. These dynamics underscore the humanitarian and governance risks associated with deterrence-based agreements that prioritise border containment over protection and institutional safeguards. The dominant theme emerging from these interventions is that they are centred on security and deterrence, with

migration treated primarily as a border control problem rather than as a climate governance and institutional challenge. A summary of the current policies from the Global North is presented in Table 4.

Table 4. Major Western Policies Addressing Irregular Migration in Africa

Policy / Programme	Primary Objective	Core Instruments and Focus	Critical Orientation (Key Critiques)
European Neighbourhood Policy (Revised 2015)	Strengthen cooperation between the EU and neighbouring African states	Emphasis on policing, border security, counterterrorism, and migration control	Migration framed mainly as a security issue, with limited attention to structural drivers such as livelihoods, governance, or climate stress (Abebe, 2019)
Joint Valletta Action Plan (2015)	Address irregular migration and forced displacement between Africa and Europe	Root causes rhetoric combined with border control, return, readmission, and anti-smuggling measures	Despite development language, implementation largely securitised and oriented toward EU stability concerns (Abebe, 2019)
EU Emergency Trust Fund for Africa (EUTF)	Promote stability and better migration management in Africa	Border control, anti-smuggling operations, security sector support, limited development projects	Security-heavy allocation diverts focus from long-term development and resilience, potentially reinforcing migration drivers (Boas, 2021)
PARSEC Programme (Mali–Burkina Faso)	Strengthen border security and surveillance	Security equipment, border management capacity, policing	Weak linkage to root causes of migration and instability; limited livelihood impact (Boas, 2021)
GAR-SI (G5 Sahel)	Combat terrorism and transnational organised crime	Training mobile counterterrorism and border units	Risk of increased corruption and coercion in peripheral regions, undermining civilian trust (Boas, 2021)

Policy / Programme	Primary Objective	Core Instruments and Focus	Critical Orientation (Key Critiques)
G5 Sahel Framework	Enhance regional security and development cooperation	Joint military force, security coordination, limited development agenda	EU support prioritises security over development, aligning more with European interests than local resilience (Boas, 2021)
EUCAP Sahel Niger	Strengthen Nigerien security forces and border control	Training police and gendarmerie, border surveillance, migration control	Reduces complex regional crises to narrow security logic, harming local economies (Boas, 2021)
EUCAP Sahel Mali	Support restoration of state authority and security sector reform	Police, gendarmerie, counterterrorism, border control	Focus on security over governance reform limits long-term stabilisation (Boas, 2021)
EU Training Mission (EUTM) Mali	Rebuild capacity of Malian Armed Forces	Military training, technical support	Limited monitoring and governance reform; failure to curb human rights abuses (Lebovich, 2018)
EU and Member State Military Deployments	Deter irregular migration and terrorism	Direct troop deployments, joint exercises, security assistance	Militarisation risks exacerbating conflict dynamics and undermining African demilitarisation goals (Abebe, 2019)
Niger Law 036 (2015)	Criminalise migrant smuggling	Arrests, asset confiscation, enforcement in Agadez	Enforcement harmed local economies, unevenly applied, and increased vulnerability without alternatives (Boas, 2021; Abebe, 2019)

Pathways to regularisation

Most of the earlier mentioned responses to irregular migration (including deportation and detention) are based on a political framework in which migration is criminalised. An alternative to this approach is regularisation, in which the

irregular migrants are given legal status. There are some examples of regularisation attempts in the recent past. The Biden Administration in the USA tried to regularise the undocumented immigrants in 2021, but the effort was largely not successful (Warren, 2021). The current US President, Donald Trump reversed the policy and commenced a nationwide crackdown on irregular migrants. In Italy, the government gave amnesty to some workers in essential sectors in 2022, to access basic services like healthcare services. In other countries, like France, Sweden and the Netherlands, regularisation is given on humanitarian grounds.

Structural limitations of Western policy responses to irregular migration

Despite increased recognition of climate-related mobility, dominant Western policy responses remain constrained by structural weaknesses that limit effectiveness. A core problem is the continued separation of climate, migration, and governance policy domains. Climate finance mechanisms prioritise technical resilience while neglecting corruption risks and institutional capture that shape whether resources reach vulnerable populations, particularly in fragile states (UNDP, 2010; Fontana, 2024). Migration governance frameworks also ignore climate–corruption interactions, viewing mobility as a security issue addressed by deterrence, border externalisation and return agreements rather than a structural consequence of governance failure under environmental stress (Boas, 2021; Abebe, 2019). Lack of coordination between migration authorities, climate funding organisations and anti-corruption groups hampers prevention. Migration controls try to reduce vulnerabilities, but border enforcement spending outweighs livelihoods, land governance and disaster institutions (Boas, 2021; World Bank, 2023c).

Emerging good practice

Although still limited, several initiatives illustrate more integrated responses to climate, mobility, and governance challenges. One emerging practice is the linking of climate resilience financing with governance safeguards. UNDP supported adaptation programmes in Bangladesh and the Sahel now incorporate corruption risk assessments, procurement transparency and community monitoring to reduce fund diversion (Transparency International Bangladesh, 2023). These measures show that resilience outcomes improve when institutional integrity is addressed. Regional frameworks also reflect progress. The IGAD Migration Policy Framework and the Kampala Ministerial Declaration recognise mobility as an adaptation strategy and promote coordination between migration,

climate adaptation, and regional governance (IOM, 2023a). In addition, World Bank Climate and Development Reports integrate climate risk, displacement and institutional capacity within unified diagnostics. Early warning and anticipatory action initiatives supported by FAO and WFP further demonstrate how forecast based financing can reduce asset loss and distress migration (FAO and WFP, 2023).

Recommendations for Policy and Practice

I. **Integrate climate fragility into migration governance frameworks:** Migration policy in the Global North should explicitly recognise climate vulnerability as a structural driver of mobility. Empirical evidence shows that climate shocks interacting with weak institutions constrain lawful migration options and increase irregular movement (IPCC, 2022; Fontana, 2024).

II. **Strengthen governance and anti-corruption safeguards in climate interventions:** Effective climate adaptation requires institutional integrity. Corruption diverts climate money, slows catastrophe response, and increases displacement (UNDP, 2010; Malaj and Firza, 2023). To guarantee affected communities receive resources, procurement openness, land administration reform and independent oversight should be prioritised.

III. **Prioritise investment in climate-resilient and diversified livelihoods:** Evidence from agriculture, pastoral systems and renewable energy indicates that livelihood stability reduces migration pressure more effectively than securitised responses (FAO and WFP, 2023). Locally led adaptation practices offer more durable and context-appropriate outcomes.

IV. **Improve multi-level and cross-regional coordination:** Fragmentation between climate, migration and governance institutions undermines preventive capacity. Structured South–North dialogue, regional monitoring platforms and integrated early-warning mechanisms can enhance policy coherence and timely response (IOM, 2023b).

V. **Expand lawful labour mobility pathways and strengthen labour regulation:** Restrictive skill-based migration regimes and ineffective labour enforcement enhance irregular migration and exploitation (de Haas, 2021; Ambrosini and Minke, 2023). Expanding formal work paths and enforcing labour rules would minimise irregular flows and migrant vulnerability.

Conclusion

This paper has shown from evidence that irregular migration from the Global South to the Global North is a survival response to ecosystems that have been destabilised by the combined effects of governance failure and climatic stress. Corruption erodes institutional capacity, distorts relief and hinders adaptation, all of which combine to turn environmental pressure into structural displacement as climate change erodes livelihoods. According to the Wheelbarrow Motion Theory, corruption and climate stress serve as reinforcing factors that create continuous momentum that is beyond the reach of deterrence, explaining why migration continues despite tighter border controls. It is not enough to address each factor separately. When legal mobility options are restricted and adaptive systems fail, irregular migration becomes a reasonable response to limited options. Therefore, decarbonisation, governance reform, transparent climate funding and anticipatory adaptation in high-risk areas must all be integrated into upstream action for effective mitigation.

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RESEARCH ARTICLE

Child support: Social welfare, gender equality and population metrics

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Abstract

Child support laws are found among most contemporary societies, yet correlational research on the demographic effects of child support remains sparse. This study compared the child support systems of 91 nations against 21 social, economic, health and environmental variables using a novel dataset and nonparametric statistical tests. Mann-Whitney and median tests revealed that robust national child support systems – equipped with a high number of enforcement mechanisms, a designated administrative agency and/or a public child support assurance program – were associated with a host of trends including lower unintended pregnancy and abortion rates, lower infant and maternal mortality rates, lower birth rates, a more educated female population and a higher ratio of women in parliament. The analysis concludes that child support is closely linked to national population metrics signifying better social welfare, gender equality and slower population growth.

Keywords

Child support, social welfare, gender equality, abortion, population.

Introduction

Humans engage in a unique way of caring for their young. Like most mammals, a human infant is born defenceless and dependent on adults for survival. Yet, unlike many mammals, human children rely on their caregivers for a prolonged period

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of their lifespan, wherein they become physically and sexually mature, but are still gaining the knowledge and skills to navigate the complexities of human society (Diamond, 1993; Bogin and Smith, 1996). The years of effort parents devote to raising their children into independent adults result in a common value among cultures that parents bear the moral responsibility to maintain a long-lasting commitment to their progeny. This has resulted in a near universal consensus that it is immoral, and in most cases, illegal, not to provide adequate support to one's own children before they reach a state of independence in adulthood.

Of course, circumstances and sentiments among individual parents vary widely, causing governments to enact policies prohibiting child abandonment and obligating child maintenance. These laws generally mandate the transfer of money or assets from one parent to another after separation to ensure their child enjoys a quality of life that is equivalent to what both parents can provide. Child support policies have been implemented around the world in a variety of different forms, creating conditions for a natural experiment.

This research examined whether child support – a policy with near-universal adoption but variable implementation – correlates with demographic patterns indicating social welfare, gender equality and population growth. Testing child support policy strictness and structure against 21 national demographic variables across 91 countries, it was hypothesised that robust child support systems would be associated with lower birth rates, reduced unintended pregnancies and abortions, improved maternal and child health, and better gender equality. The analysis found consistent associations supporting these hypotheses, suggesting that child support policy may function as an understudied lever in global demographic outcomes. It is concluded that child support is a cost-effective, bipartisan policy that, when properly administered and enforced, may yield more benefits than previously recognised.

Prior literature

Since the mid-1900s, there have been sweeping changes to the human social structure. Marriage rates have declined sharply (Demographic, 2023) and children born to married parents have become a smaller fraction of global births with each passing decade. As evidence, the average proportion of unmarried births in countries belonging to the Organisation for Economic Co-operation and

Development (OECD) has ballooned from six per cent in 1960 to 40.2 per cent in 2020 (OECD Family Database, 2022). Meanwhile, effective and affordable contraception has become widely available, with its use among married women doubling since 1970 (Contraceptive, 2024).

The proportion of women completing secondary education has also more than doubled over the course of just a few decades (Lower secondary, 2023), and an increasing number of women from rich and poor countries alike are choosing to enter the labour force (Goldin, 1994), though they still face wage disparities compared to men (Global Wage, 2018). Given these widespread trends, it is unlikely that a vast majority of children will be born into traditional, single-earner, nuclear families in the coming decades.

Child support (*child maintenance* or *child alimony*, interchangeably) is defined for the purposes of this research as legally mandated transfers of funds from one parent to another for the benefit of a child (Child support, 2022). Inclusive in this definition are the less common instances of prenatal support and maintenance paid directly to adult children. Child support is intended to ensure a child's standard of living is approximately commensurate with the income of both parents, with the secondary aims of preventing family reliance on other forms of state and social assistance and holding parents accountable for maintaining their own children. In this sense, child support functions as more than an excise tax on non-custodial parents. It provides basic protection against the widely denounced crime of child abandonment and has been enshrined in Article 27 of the United Nations Convention on the Rights of the Child (1989), occupying a middle ground between governments explicitly controlling the reproductive decisions of citizens and allowing parents to shed all responsibility for the children they conceive.

Like many taxpayer-funded welfare programmes, child support is highly complex, requiring the establishment of filiation and custody, determining appropriate awards and tracking obligor income. Unlike other welfare programmes, however, child support remains largely uncontroversial among nations of all sizes, political regimes and creeds – typically receiving support from those seeking to reduce child poverty and others pushing to cut welfare expenses and crack down on non-compliant or payment-defaulting parents (Cook et al., 2024).

The origins of contemporary western child support policy can be traced back to the English Poor Laws of the late 1500s and early 1600s. Passed in response to a severe economic downturn in the United Kingdom, the Poor Laws granted local parishes the authority to raise taxes and provide alms for vagrant, unemployed and helpless residents (Hansan, 2011). These laws explicitly proclaimed that parents were required to keep and maintain their children. When parishes provided support to unwed single mothers, they would then work to recoup these funds from the absent fathers (Bloy, 2002; Nutt, 2006).

By contrast, child support in many predominantly Muslim nations is based on traditional Shariah law, which derives its mandates from the Quran. While Shariah law dictates maintenance owed to wives and children by married men, it offers little acknowledgement to children born out of wedlock (Mughniyya, 2016).

Jurisdiction over child support is usually granted to local courts. However, the evolving needs of families have caused a handful of countries to establish administrative agencies specifically devoted to processing child support cases. Because these agencies often share jurisdiction with family courts, it became necessary to reconcile judicial and administrative child support schemes so that both are governed by the same rules and procedures (Carbone, 2000). A small number of countries, such as Norway, Australia, Denmark, Iceland, New Zealand and the United Kingdom have given nearly all jurisdiction over child support to administrative agencies.

There have been various benefits and drawbacks to delegating child support to administrative agencies. Courts operate mainly on a discretionary basis where the details and circumstances of each case are examined in context, while agencies take a more standardised, formulaic approach (Bernardi and Mortelmans, 2021) and are able to handle petitions more efficiently by following a strict set of guidelines, as opposed to judicial discretion, for how child support is calculated and enforced (Skinner et al., 2007; Skinner and Davidson, 2009). The administrative approach helps save petitioners both time and money by removing the need to schedule court appearances and hire legal representation; two hurdles that can discourage custodial parents from seeking child support (Cook, 2022). However, some have voiced concerns that administrative child support agencies are undemocratic in that they are often managed by appointed officials and directed

by a complex set of rules and protocols over which the common citizen has little influence (Gay, 2003).

A new paradigm in child support policy emerged in the 1990s when, in response to rising divorce rates and welfare expenditures, policymakers began to view child support as an opportunity to reduce single-parent welfare dependency by passing these costs on to noncustodial parents (Hansen, 1999; Solomon-Fears, 2016). This paradigm shift coincided with a movement among some nations to establish publicly-funded assurance programs that guarantee child support income to custodial parents when an obligor fails to pay (Skinner et al., 2007; Hakovirta et al., 2020). Backing child support obligations with public funds while working to recoup these payments from debtors was seen as an effective way to decrease child poverty at minimal taxpayer expense.

In recent decades, child support has evolved into highly sophisticated programmes with many moving parts. Innovations in public records and data management systems have made new enforcement mechanisms possible to implement at mass scale. Employment registers, tax records and credit reporting agencies now track citizen financial activity in many nations, allowing governments to more easily garnish wages, seize assets and freeze the bank accounts of debtors. Modern border protections also make it difficult for child support obligors to flee their home countries. For those who do emigrate, enforcing maintenance orders across borders has become less daunting thanks to international treaties like the 1989 Inter-American Convention on Support Obligations and the 2007 Hague Convention on the International Recovery of Child Support.

Perhaps the most important development in the history of child support has been the invention of genetic paternity tests. Genetic testing has successfully moved most countries away from archaic witness-based or marriage-based means of establishing filiation in favour of vastly more accurate DNA analysis (Pena and Chakraborty, 1994), although the costs of such tests remain a significant barrier to uptake in some nations.

While there is ample evidence that child support laws accomplish the goal of reducing child poverty (Cuesta and Meyer, 2014; Cuesta et al., 2018; Hakovirta and Jokela, 2018) studies suggest that child support policy can exhibit secondary

effects on reproductive decisions. Knowing that child support laws can impose financial consequences on having a child, even without custody of said child, has been found to result in an increased use of contraceptives (Huang and Han, 2004, 2007) and it is generally concluded that child support enforcement creates a tempering effect on birth rates (Aizer and McLanahan, 2006; Case, 1998; Huang and Han, 2012), especially among unmarried partners (Plotnick et al., 2007), teenagers (Plotnick et al., 2004), those who already pay child support (Anderson, 2011) and those who know someone with a child support order (Huang and Han, 2004).

Strong child support laws are also found to be associated with fewer total abortions, which is likely due to a parallel decrease in unintended pregnancies (Crowley et al., 2012; Tannenbaum, 2020). When unintended pregnancies do occur, the promise of receiving payments to reduce the cost of childrearing may cause women to be less hesitant to carry a baby to term (Garfinkel et al., 2003; Cowan and Douds, 2022; González and Trommlerová, 2023).

Child support appears to exhibit a much weaker effect on marital birth rates (Huang, 2001), presumably since married partners have already taken steps to form a committed family unit and have exposed themselves to the risk of financial losses associated with divorce. Considering the global decline in married births, national child support policies are likely to be exerting greater influence on reproductive decisions than ever before. This research examines whether the above findings are similarly reflected in global demographic data.

Methods

This study sought to identify specific demographic variables associated with national child support policy structure. Possible reverberating effects of child support systems were identified by comparing national child support laws with 21 corresponding demographic variables utilizing Mann-Whitney, Mood's median and other nonparametric statistical tests.

Sample

A sample of 91 countries across six continents was compiled by combining eight sources of international child support policy data (Table 1).

Table 1. Sources dictating inclusion in the sample

Source	Type
Cuesta, Hakovirta, Haapnanen and Meyer, 2023	Systematic review
Hakovirta and Mesiäislehto, 2022	Systematic review
OECD Family Database	International database
Thomson Reuters Practical Law Connect	International database
European e-Justice Portal	International database
Nordic Council	International database
Hague Conference on Private International Law	International database
Inter-American Convention on Support Obligations	International agreement

These sources represent some of the largest publicly accessible datasets on national child support law, covering 78 per cent of the global population and 74 per cent of Earth's total inhabited land area. Though an outsized portion of available data is derived from Europe, this sample was spread among six continents (Table 2) to reduce regional bias and support external validity and global generalisation. Countries that did not appear in the above sources were excluded from the sample.

Table 2. Sample countries by CIA World Factbook (2023) regions

Region	*N*	%
Africa	14	15.4
Australia and Oceania	2	2.2
Central America and the Caribbean	7	7.7
Central Asia	3	3.3
East and Southeast Asia	10	11.0
Europe	35	38.5
Middle East	5	5.5
North America	3	3.3
South America	10	11.0
South Asia	2	2.2
TOTAL	**91**	**100.0**

Variables

Each country's child support system was scored based on how many of a predetermined set of enforcement mechanisms were established to maintain compliance. These nine enforcement mechanisms, compiled from an initial review of the literature, were as follows:

1. **Minimum Payments** (debt accrues even with no obligor income or assets)
2. **Cross-Border Treaties** (extraterritorial enforcement)
3. **Garnishments/Liens/Holds/Attachments** (income and assets may be seized)
4. **Fees/Interest** (increases to total amount owed)
5. **Withholding Government Payments/Services** (tax refunds, licences, permits or welfare payments withheld)
6. **Credit Reporting** (ability to obtain credit impacted)
7. **Travel Restrictions** (driver's license or passport rescinded)
8. **Criminal Penalties** (fines or imprisonment)
9. **Public Shaming** (placement on a public list of child support debtors)

Sources reviewed for evidence of child support structure and enforcement mechanisms were identified and collected through West Chester University Libraries, Google Search and Google Scholar. These sources included civil, criminal and family legal codes, official government publications, peer-reviewed research, news articles, and law firm content (see supplementary materials). When necessary, web pages and legal documents were translated to English using Google Translate. Information not derived from a government or peer-reviewed publication was corroborated by at least one additional source to maintain consistent data quality throughout the study. Countries lacking quality or sufficient data were excluded from the sample.

Next, national child support systems were evaluated on whether they included an administrative child support agency and/or a public assurance programme – all entered as binary yes/no variables. Finally, 21 additional population metrics were compiled from multinational datasets to test a wide range of factors that could be associated with child support policies (see Appendix, Table A1 for list of variables and sources).

In limited instances, additional steps were taken to recode the raw data. The number of enforcement mechanisms was summed into a country's total child support enforcement score and recoded into a binary variable of low (0–4) or high (5–9) to ensure statistical tests with this variable had sufficient group sizes. Due to the inconsistent availability of annual divorce rate data, crude divorce rates were averaged over the period of 2018 to 2022.

Analysis

Child support enforcement data were entered manually into a REDCap online database (Harris et al., 2009, 2019) and exported to the International Business Machines Statistical Package for the Social Sciences (SPSS) for analysis. Additional national demographic variables were matched and added to the SPSS dataset from comma-separated value (CSV) files.

Frequency distributions and descriptive statistics were compiled to display variable characteristics and levels of skewness and kurtosis were calculated to evaluate data normality. Only three variables (divorce rates, female seats in parliament, Hofstede individuality) showed nonsignificant Shapiro-Wilk scores ($\alpha = .05$) and, thus, most variables were assumed to have non-normal distributions. Nonparametric tests were ultimately chosen for this analysis since they reduce the effects of outliers and rely on less assumptions of normality in data distribution.

Chi square tests were conducted to discern relationships between categorical variables, and Mann-Whitney U tests were performed on interval variables grouped by child support policy characteristics to identify significant differences in group distributions (specifically, the summed ranks of the data points within each group). Median tests were then used to evaluate differences in group medians, with Yates's Continuity Correction producing more conservative figures to reduce the risk of finding a significant difference between medians (type I error) where none exists.

Limitations

This study was based on a non-random sample of nations selected by compiling global, public-use datasets of child support laws. Because countries absent from the above sources were excluded, the sample is assumed to be biased toward nations that have child support policies in place, collect data on how child support is enforced, and/or are parties to international child support treaties. Additionally, all datasets and instruments used in this analysis may be subject to their own biases and limitations.

It is difficult to study child support using positivist methods of policy evaluation when so many factors are left to the discretion of family courts, and when the reverberating effects are often delayed and indirect. Since child support simply increases the income of a custodial parent, all other benefits stemming from its enforcement are, at best, secondary and tertiary in nature.

National demographic metrics themselves are influenced by countless interacting components, with child support being one of many factors that influence human reproductive and economic outcomes. The internal validity of this study was therefore limited by the implausibility of inferring a direct causal link between child support policy and population demographics, as there are too many confounding variables and feedback loops to consider. As such, the study's objectives were limited to identifying various associations between child support policy and population demographics that can be examined more thoroughly with localised econometric analysis. Further investigation may also help establish the reliability of this methodology, given that this was the first attempt to score child support policies based on the stated criteria.

The effectiveness of child support policies and the strictness of their enforcement can be evaluated from many angles, such as the percentage of single parents receiving child support, the percentage of cases in arrears, the total value of arrears, and total spending on child support enforcement. This study used the number of enforcement mechanisms in place against noncompliance to represent the relative strength of child support policies. There was no attempt to measure how often these mechanisms are utilised or how effective they are at inducing payment.

While this rating system attempted to capture the various means that child support policy is enforced, the following enforcement mechanisms, identified during the later stages of data gathering, were not accounted for in the scoring system:

1. Revoking child custody and/or visitation rights
2. Barring debtors from running for or holding public office
3. Passing child support debt on to other relatives

These particular mechanisms are rarely found in the literature, though they may exhibit measurable effects on overall levels of compliance. Passing child support obligations on to the next of kin is perhaps the most consequential of these factors in that it may represent a *de facto* form of guaranteed maintenance. If an obligor fails to pay, the burden falls on the next family member in line. This creates what may amount to a child support assurance scheme, though it is doubtful these laws are as effective as disbursing payments from public coffers.

Lastly, given the large number of data sources employed in this study, all variables were intended to reflect the most recent year available. This resulted in a dataset composed of variables sourced mostly between 2019 and 2023, as opposed to all falling in the same year, which may limit the study's ability to create a precise cross-section of the sample population.

Results by child support policy attribute

Of the 91 countries included in the sample, 24 (26.4%) had administrative agencies for processing child support cases while 27 (29.7%) had a public child support assurance programme in place. Thirty-six countries fell into the low enforcement category with 0–4 enforcement mechanisms and 55 countries fell into the high enforcement category with 5–9. The median number of enforcement mechanisms per country was 5 and the mode was also 5 (n = 22). The most common enforcement mechanisms were *garnishments/liens/holds/attachments* (n = 84) and *criminal penalties* (n = 81). The least common enforcement mechanisms were *credit reporting* (n = 23) and *public shaming* (n = 13). See Appendix, Table A2 for the full frequency table.

The existence of any of the three characteristics correlated with the existence of the other two. Countries with a high number of enforcement mechanisms were four times more likely to have an administrative child support agency than not (χ^2 = 7.145, p = .008) and five times more likely to have a public assurance program than not (χ^2 = 9.832, p = .002), indicating that strict enforcement is often tied to the underlying structure of a child support system.

Enforcement scores

As predicted, high child support enforcement scores were associated with several global demographic trends. The median abortion rate of high enforcement countries was half that of the low enforcement group (15.85 versus 31.43 per 1,000 women), as were unintended pregnancies (35.78 versus 75.21 per 1,000 women). Median infant mortality was much lower in the high enforcement group (4.9 versus 18.55 per 1,000 live births) and so was the median maternal mortality (11.41 versus 98.82 per 100,000 live births). As a group, countries with high child support enforcement scores were also significantly wealthier, happier and more educated than those with low enforcement scores, among other positive metrics (see Appendix, Table A4).

From a granular perspective, the research revealed that child support enforcement methods tend to differ regionally based on a variety of cultural and political factors. For example, the post-Soviet states have relatively harsh punishments for noncompliance compared to other nations, while tourist destinations like the Philippines appear to be focused more on procuring child support payments from foreigners. Child support enforcement in many parts of the African continent continues to be hindered by difficulties in registering filiation and tracking obligor income as governments work to build up the necessary technology and record-keeping infrastructure.

Child support in systems in countries with high Muslim populations, such as Malaysia, are often built upon traditional laws automatically assigning custody based on the age or sex of the child and the sex, marital status and religion of the parent. In most Muslim theocracies, child and spousal maintenance falls under the authority of clerics who approach awards and enforcement through the lens of Shariah law, while non-Muslims are held to different sets of secular or religious laws according to their faith.

In South and Central America, a so-called crisis of single parenthood has inspired nations to ramp up child support enforcement and publish child support debtor lists Zea, 2023). Some have even taken the pivotal step of allowing mothers to establish paternity upon the birth of their child by simply naming the father (Grossman, 2021). Under this *opt-out* or *responsible paternity* model (Milanich, 2017), alleged fathers are presumed to be a child's parent and liable for maintenance until proven otherwise by a DNA test, saving single mothers the time and stress of seeking the cooperation of an unwilling ex-partner to establish filiation.

Administrative agencies

While most countries in the sample adjudicate child support in civil and family courts, approximately 1/4 of the sample (n = 24) has granted a separate administrative agency the authority to process and enforce child support orders. These nations tend to be wealthier in both median gross domestic product (GDP) and gross national income (GNI) per capita, have a greater median percentage of women in parliament and score much lower on the Gender Inequality Index than countries with only court-based systems (see Appendix, Table A5).

Countries with administrative child support agencies were also found to experience much less government corruption, with a median score on the Corruption Perception Index that is 79 per cent better than those without (71.67 versus 40.00, with 100 signifying the least corruption). This reinforces the view of Holmes and Sunstein that 'equal treatment before the law cannot be secured over a vast territory without relatively effective, honest, centralized bureaucratic agencies capable of creating and enforcing rights' (1999: 58).

Nations with administrative child support agencies showed similarly high Hofstede Individualism scores, indicating that citizens tend to prioritise themselves and their immediate families over their neighbours and communities. This may explain why individualistic nations are more prone to rely on the state to dictate child maintenance as opposed to informal social safety nets – a notion that is backed by Deneen (2018) and Marohn (2020), who argue that individualism and statism go hand-in-hand. Interestingly, Corruption Perception Index scores also displayed a strong positive correlation with Hofstede Individualism scores ($\tau b = .597$, $p < .001$), suggesting that the more individualistic a nation is, the less government corruption it tends to experience.

Public assurance

Child support assurance (also known as *guaranteed maintenance* or *advanced maintenance*) refers to a programme that ensures custodial parents receive child support regardless of an obligor's ability or willingness to pay. In most cases, custodial parents are granted advanced payments immediately from public funds that are later recouped from the obliging parent. Approximately a third of the countries studied (n = 27) had publicly funded child support assurance programmes in place, guaranteeing income to custodial parents when obligors fail to pay. Most of these assurance programmes are found in Europe, with the exceptions of Malaysia and South Korea.

The most noteworthy attributes of nations that invest in child support assurance programmes are their reproductive outcomes, which stood in stark contrast to those without a public guarantee. Specifically, they have less than half the median unintended pregnancy rate, a third the median abortion rate, a quarter of the median infant mortality rate, a fifth of the median adolescent birth rate, and a thirteenth of the median maternal mortality rate compared with nations without child support assurance (Appendix, Table A6). Indicators of social welfare and gender equality in nations with child support assurance also stand out, with considerably low levels of child poverty, more income distributed to the bottom half of earners and better scores on the Gender Inequality Index.

Areas of further analysis

There were three specific areas of interest that merited deeper analysis into the relationship between child support policy and demographic trends: social welfare, gender equality, and population growth.

Social welfare

Of Esping-Andersen's (1990) three welfare typologies – liberal, conservative and social democratic – it is primarily well-established social democratic regimes that have folded child support into their overarching systems for the eradication of poverty. By contrast, liberal regimes tend to use child support primarily to offset other welfare outlays and conservative regimes enforce child support as a safety net when all other informal options have failed (Cook et al., 2024).

From a more nuanced perspective, child support does not easily fit among typical welfare entitlement programmes since it often exists within a niche area of civil and family litigation. In instances where child support does resemble means-tested social programmes, it rarely follows the Rawlsian principle of prioritising benefits for the least advantaged members of society (Rawls, 1971). On the contrary, child support is available to the poor and wealthy alike and is often paid in greater sums among the wealthy.

Child support policies also rarely seek to create consistency of outcomes via coercive or paternalistic (Mead, 1997) methods of social control by dictating how parents spend these funds. Instead, child support payments can be seen as a type of unconditional cash transfer where there can be no guarantee the money will be spent on basic needs. The various benefits and drawbacks of unconditional cash transfers as a welfare instrument remain a source of ongoing debate among scholars (Baird et al., 2013; Aizer et al., 2016; Handa et al., 2018; Bastagli et al., 2019). However, as an administrative programme, this model is relatively inexpensive to maintain. In the United States, the House Committee on Ways and Means recently noted that for every $1.00 spent on child support operations in 2023, nearly $5.00 was collected for families, making child support one of the most cost-effective federal programmes (Bipartisan, 2024).

Critics have warned that, because child support can offset other welfare benefits to creditors while reducing the income of debtors, it puts downward economic pressure on people living in poverty, who, as a group, tend to have more children (Birdsall and Griffin, 1988; Dribe et al., 2014) and are more likely to be single parents (Nieuwenhuis and Maldonado, 2018) than those earning above the poverty line. Others posit that child support policies may simply reshuffle child poverty when payments benefit a parent's non-custodial children while simultaneously taking resources away from children of whom they have custody. While these concerns are valid, research suggests that child support payments result in a net-reduction in overall child poverty with minimal poverty-reshuffling effects (Cuesta and Meyer, 2018). As evidenced in this study, countries with robust child support systems are more likely to have low child poverty rates, high GDP and GNI per capita, and a greater share of total income going to the bottom fifty per cent of earners.

Gender equality

National child support policies rarely include an explicit differentiation between the sex of the parents or their children – with the exception of countries where religious and social traditions bifurcate the legal rights of citizens based on sex. Yet it is important to acknowledge that the vast majority of global child support cases involve custodial mothers seeking support from non-custodial fathers (Cook, 2022; Cook et al., 2024). In the United States alone, it is estimated that women maintain upwards of eighty per cent of one-parent families (Census Bureau, 2022).

While this research does not attempt to provide specific reasons why men and women are more likely to play certain familial roles, it is assumed that child support is prioritised and written into law when groups with sufficient political influence take action (Birkland, 2015). Thus, the percentage of women who vote, lobby and/or hold office within a nation is likely to be a strong factor in the formation and passage of child support law, which helps explain the observed link between gender equality indicators and child support policy structure. Given child support's association with lower unintended pregnancy rates, abortion rates, child poverty rates and infant/maternal mortality rates, effective child support policy should continue to be top-of-mind for the global feminist and women's rights movements.

Population growth

Population change can be considered positive or negative depending on a diverse range of viewpoints. Economists who link rising numbers with public optimism, a growing workforce and consumer base, and an increase in the *ultimate resource* of human ingenuity (Simon, 1981) may be happy to see steadily increasing national populations. Environmentalists, on the other hand, tend to link population growth with unsustainable levels of resource consumption, habitat destruction and pollution, and see population decline as a necessary step to avoiding ecological crisis (Lianos and Pseiridis, 2016; Samways, 2022; Saraswati et al., 2024).

Data from the sample indicated that strong child support systems were associated with lower birth rates. The median crude birth rate in high child support enforcement countries was 36% lower than that of low enforcement countries ($p = .015$), while median crude birth rates were 31% lower in countries

with administrative agencies (p = .002) and 42% lower in those with public assurance programmes (p < .001) compared to those without (see Appendix, Tables A4–A6).

Birth rates are not the only factor influencing national population levels, however. Migration, life expectancy and age at childbearing similarly determine whether a national population is growing or shrinking. In fact, it is more pertinent to examine the rate of natural increase (births minus deaths) or change in total population over time when analysing population growth. Calculating the median rate of natural increase and the median ten-year percentage change in total population of the groups, countries with strong child support programmes were found to be growing much more slowly relative to their counterparts (Table 3).

Table 3. Population growth by child support policy attribute

Group	2022 Median Rate of Natural Increase (births minus deaths per 1,000 people)	2013–2023 Median % Population Change (over period)
Enforcement Score		
Low (0–4)	9.9	14.7
High (5–9)	.9	6.4
Administrative Agency		
No	7.2	11.0
Yes	.9	6.4
Public Assurance		
No	7.9	12.5
Yes	-2.3	3.3

Note. Shaded cells were not statistically significant at α = .05.

Nevertheless, immigration and longer life expectancies continue to make national populations resistant to falling birth rates. Only 31 countries in the sample are currently showing a negative rate of natural increase and only fifteen have experienced an absolute decrease in population over the past decade.

Conclusion

This cross-national study examined child support policy across 91 countries, revealing consistent patterns linking robust child support systems to positive demographic outcomes. Countries with strong child support enforcement mechanisms, designated administrative agencies and public assurance programmes demonstrated significantly lower rates of unintended pregnancy and abortion, reduced infant and maternal mortality, lower birth rates, and greater gender equality. These findings suggest that child support functions not only as a poverty reduction measure, but as a policy tool that could be influencing global reproductive and demographic patterns.

Nations that implement robust child support programmes with administrative agencies, public assurance and high enforcement tended to be those that are highly individualistic, with low levels of perceived government corruption. These nations were often wealthier per capita, with low child poverty rates and a greater percentage of income going to the bottom half of earners.

The observed relationship between child support systems and gender equality indicators likely reflects a bidirectional dynamic. As women gain political voice and economic power, they are better positioned to advocate for child support policies that protect their interests and those of their children. Conversely, strong child support enforcement and guaranteed payments may empower women by providing economic security when raising children outside of traditional family structures.

The association between strong child support enforcement and lower birth rates indicates that financial accountability for childrearing may encourage more deliberate family planning. When individuals understand that having a child carries enforceable financial obligations regardless of relationship status or custody arrangements, they are more likely to use contraception effectively and consider the timing and circumstances of parenthood more carefully.

While child support policy enjoys unusual bipartisan support across the political spectrum – appealing to those concerned with both child poverty reduction and fiscal responsibility – its implementation varies considerably across nations. The evidence presented here suggests that countries may benefit from moving

beyond basic child support mandates to establish comprehensive systems featuring multiple enforcement mechanisms, standalone administrative agencies and public assurance programmes that guarantee minimum support levels regardless of obligor compliance.

Future research should explore the mechanisms through which child support policies could produce these demographic effects, including longitudinal studies tracking the impacts of policy changes over time. Additionally, investigating how child support systems interact with other family policies such as parental leave, childcare subsidies and reproductive healthcare access, would provide a more complete understanding of the observed trends.

Child support offers a pragmatic, politically viable lever that operates at the intersection of social welfare, gender equality and population growth. Unlike coercive population policies that violate reproductive rights, child support enforcement works through economic incentives that encourage deliberate family planning while protecting child welfare. For policymakers concerned with both population sustainability and social equity, strengthening child support systems represents a rare opportunity to advance multiple objectives simultaneously: moderating population growth through voluntary fertility decline, reducing child poverty and maternal mortality, and advancing gender equality. In an era of global population transition, child support reform deserves recognition as a component of both welfare and sustainability policy.

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Table A1. National Demographic Variables and Sources

Variable	Source
Abortion Rate (model estimated)	Bearak, J.M., A. Popinchalk, C. Beavin, B. Ganatra … and L. Alkema. 2022. 'Country-specific estimates of unintended pregnancy and abortion incidence: A global comparative analysis of levels in 2015–2019'. *BMJ Global Health* **7** (3): e007151. https://doi.org/10.1136/bmjgh-2021-007151
Adolescent Births (per 1,000 women)	Gender Inequality Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index
Birth Rate (per 1,000 people)	*Birth rate, crude (per 1,000 people)*. 2022. [Dataset]. World Bank Open Data. https://data.worldbank.org
Cantril Ladder Score	Helliwell, J., H. Huang, H. Shiplett and S. Wang. 2024. 'Happiness of the younger, the older, and those in between'. In *World Happiness Report*. University of Oxford. https://doi.org/10.18724/WHR-F1P2-QJ33
Child Poverty (% income under $3.65 per day)	Salmeron Gomez, D., S. Engilbertsdottir, J.A. Cuesta Leiva, D. Newhouse and D. Stewart. 2023. *Global Trends in Child Monetary Poverty According to International Poverty Lines*. Washington, D.C.: World Bank. https://doi.org/10.1596/1813-9450-10525
Child Poverty (% under half of median disposable income)	*OECD Family Database*. 2018. [Dataset]. https://www.oecd.org/en/data/datasets/oecd-family-database.html
Corruption Perceptions Index Score	*Corruption Perceptions Index Rank | Indicator Profile | Prosperity Data360*. 2023. [Dataset]. https://prosperitydata360.worldbank.org/en/indicator/TI+CPI+Rank

Death Rate (per 1,000 people)	*Death rate, crude (per 1,000 people)*. 2022. [Dataset]. World Bank Open Data. https://data.worldbank.org
Divorce Rate (2018–2022)	*UNSD – Demographic and Social Statistics*. 2023. https://unstats.un.org/unsd/demographic-social/products/dyb/dyb_2023/
Education (years, 25 and older)	Human Development Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/human-development-index
Female Labor Force Participation (% women age 15+)	*Labor force participation rate (% of population)*. 2023. [Dataset]. World Bank Gender Data Portal. https://genderdata.worldbank.org/en/indicator/sl-tlf-acti-zs
Female Seats in Parliament (%)	Gender Inequality Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index
Female Some Secondary Education (%)	Gender Inequality Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index
GDP Per Capita (USD)	*GDP per capita (current US$)*. 2023. [Dataset]. https://data.worldbank.org
Gender Inequality Index Score	Gender Inequality Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index
GNI Per Capita (PPP)	GNI per capita, PPP (current international $). 2023. [Dataset]. https://data.worldbank.org
Hofstede Individualism Score	*Country comparison tool*. 2023. The Culture Factor Group. https://www.theculturefactor.com/country-comparison-tool

Income Equality (% of income to bottom half of earners)	*World Inequality Database*. 2023. [Dataset]. https://wid.world/data/
Infant Mortality (per 1,000 births)	Gender Inequality Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index
Life Expectancy at Birth (years)	Human Development Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/human-development-index
Maternal Mortality (per 100,000 births)	Gender Inequality Index. 2022. [Dataset]. In *Human Development Reports*. United Nations. https://hdr.undp.org/data-center/thematic-composite-indices/gender-inequality-index
Population	*Population, total*. 2024. [Dataset]. https://data.worldbank.org
Unintended Pregnancy Rate (model estimated)	Bearak, J.M., A. Popinchalk, C. Beavin, B. Ganatra … and L. Alkema. 2022. 'Country-specific estimates of unintended pregnancy and abortion incidence: A global comparative analysis of levels in 2015–2019'. *BMJ Global Health* **7** (3): e007151. https://doi.org/10.1136/bmjgh-2021-007151

Table A2. Frequencies of Categorical Variables

Variable	N	%
Administrative Agency		
Yes	24	26.4
No	67	73.6
Public Assurance Programme		
Yes	27	29.7
No	64	70.3
Employment Programme		
Yes	4	4.4
No	87	95.6
Enforcement Score		
0	0	0
1	4	4.4
2	13	14.3
3	10	11.0
4	9	9.9
5	22	24.2
6	16	17.6
7	13	14.3
8	3	3.3
9	1	1.1
Enforcement Score Category		
Low (0–4)	36	39.6
High (5–9)	55	60.4
Enforcement Mechanisms		
Minimum Payments	28	30.8
Cross-Border Treaties	71	78.0
Garnishments/Liens/Holds/Attachments	84	92.3
Fees/Interest on Arrears	47	51.6
Withholding Government Payments/Services	40	44.0
Credit Reporting	23	25.3
Restricted Travel	39	42.9
Criminal penalties	81	89.0
Public Shaming	13	14.3

Table A3. Distribution of Interval Variables

Variable	N	Mean (SD)	Median (IQR)
Abortion Rate (per 1,000 women)	79	24.33 (15.66)	21.00 (22.42)
Adolescent births (per 1,000 women)	91	30.701 (30.52)	15.66 (46.51)
Birth Rate (per 1,000 people)	91	14.54 (7.35)	11.6 (9.84)
Cantril Ladder Score (life satisfaction ranked 1-10)	86	5.96 (1.04)	6.13 (1.32)
Child Poverty (% income < $3.65 per day)	75	15.19 (23.08)	2.50 (21.70)
Child Poverty (% income < 1/2 of median)	44	14.90 (7.36)	12.85 (10.22)
Corruption Perception Index Score	90	50.10 (19.09)	45.50 (33.25)
Divorce Rate (per 1,000 people)	52	1.78 (0.71)	1.73 (0.87)
Education (years)	91	10.37 (2.76)	11.12 (4.04)
Female Labor Force Participation (%)	91	53.64 (10.34)	54.41 (9.54)
Female Seats in Parliament (%)	90	29.41 (11.88)	27.67 (18.75)
Female Some Secondary Education (%)	91	72.97 (25.16)	82.03 (39.87)
GDP Per Capita (USD)	91	24,072.61 (26,859.91)	13,365.36 (29,775.48)
Gender Inequality Index	90	.25 (.18)	0.22 (0.32)
GNI Per Capita (PPP)	91	28,679.54 (20,975.15)	24,431.00 (32,972.27)
Hofstede Individualism Score	79	46.67 (24.19)	48.00 (40.00)
Income Equality (share of bottom 50%)	91	15.88 (5.03)	15.77 (8.89)
Infant Mortality (per 1,000 live births)	91	12.86 (12.76)	8.00 (17.80)
Life Expectancy (years)	91	74.95 (7.54)	75.93 (11.68)
Maternal Mortality (per 100,000 live births)	90	73.99 (138.86)	18.48 (76.38)
Unintended Pregnancy Rate (per 1,000 women)	79	53.62 (27.24)	44.38 (43.20)

Table A4. Nonparametric Tests by Enforcement Score Category (Low/High)

	Mann-Whitney U Test					Median Test			
Variable	Low (0–4) Mean Rank	High (5–9) Mean Rank	Test Statistic	P		Low (0–4) Median	High (5–9) Median	χ2 Yates'	P
Abortion Rate (per 1,000 women)	50.35	34.92	-2.807	.005		31.43	15.86	10.187	.001
Adolescent Births (per 1,000 women)	52.25	41.91	-1.826	.068		32.59	14.36	1.338	.247
Birth Rate (per 1,000 people)	57.93	38.19	-3.486	<.001		16.99	10.80	5.969	.015
Cantril Ladder (life satisfaction ranked 1-10)	29.09	52.04	4.119	<.001		5.33	6.36	14.383	<.001
Child Poverty (% income < $3.65 per day)	46.50	32.64	-2.648	.007		9.40	1.55	3.955	.047
Child Poverty (% income < 1/2 of median)	25.89	21.63	0.375	.389		14.00	12.30	.559	.455
Corruption Perception Index	39.14	49.55	1.842	.065		40.33	55.00	1.683	.195
Divorce Rate (per 1,000 people)	23.50	27.40	0.782	.434		1.58	1.74	.108	.742
Education (years)	32.17	55.05	4.042	<.001		8.72	12.24	7.303	.007
Female Labour Force Participation (%)	44.86	46.75	0.333	.739		54.63	53.98	.017	.897

Female Seats in Parliament (%)	36.81	51.30	2.578	.010		21.64	31.55	3.750	.053
Female Some Secondary Education (%)	31.97	55.18	4.099	<.001		59.09	89.88	9.804	.002
GDP Per Capita (USD)	33.89	53.93	3.539	<.001		4,905.58	18,732.50	9.804	.002
Gender Inequality Index	58.01	37.16	-3.710	<.001		.41	.16	7.824	.005
GNI Per Capita (PPP)	35.58	52.82	3.044	.002		11,511.99	32,171.25	3.403	.065
Hofstede Individualism	29.37	45.22	2.886	.004		29.50	54.33	6.529	.011
Income Equality (share of bottom 50%)	39.10	50.52	2.017	.044		.1415	.1723	5.169	.023
Infant Mortality (per 1,000 live births)	59.78	36.98	-4.026	<.001		18.55	4.90	9.260	.002
Life Expectancy (years)	36.36	52.31	2.816	.005		72.85	77.32	2.005	.157
Maternal Mortality (per 100,000 live births)	59.08	36.44	-4.027	<.001		94.82	11.41	7.824	.005
Unintended Pregnancy Rate (per 1,000 women)	53.42	33.42	-3.641	<.001		75.21	35.78	7.359	.007

Note. Shaded cells are not statistically significant at $\alpha = .05$

Table A5. Nonparametric Tests by Administrative Agency (No/Yes)

	Mann-Whitney U Test					Median Test			
Variable	**No Mean Rank**	**Yes Mean Rank**	**Test Statistic**	**P**		**No Median**	**Yes Median**	**χ^2 Yates's**	**P**
Abortion Rate (per 1,000 women)	45.47	27.46	-3.209	.001		29.27	12.36	9.649	.002
Adolescent births (per 1,000 women)	50.51	33.42	-2.720	.007		29.69	8.70	9.181	.002
Birth Rate (per 1,000 people)	48.92	37.85	-1.761	.078		14.47	9.93	9.181	.002
Cantril Ladder (life satisfaction ranked 1–10)	37.06	60.13	3.842	<.001		6.02	6.79	6.993	.008
Child Poverty (% income < $3.65 per day)	42.04	26.61	-2.755	.006		5.45	.30	6.135	.013
Child Poverty (% income < 1/2 of median)	27.78	14.12	-3.435	<.001		17.94	10.90	2.328	.127
Corruption Perception Index	39.08	63.17	3.870	<.001		40.00	71.67	6.875	.009
Divorce Rate (per 1,000 people)	25.03	29.05	0.922	.357		1.60	1.88	1.327	.249
Education (years)	39.66	63.71	3.828	<.001		10.42	12.82	7.181	.007
Female Labor Force Participation (%)	42.28	56.38	2.243	.025		53.52	57.99	1.568	.210

Female Seats in Parliament (%)	40.97	57.96	2.728	.006		25.71	35.73	6.875	.009
Female Some Secondary Education (%)	41.13	59.58	2.936	.003		74.42	94.82	9.957	.002
GDP Per Capita (USD)	39.92	62.98	3.670	<.001		9,537.68	48,467.25	7.181	.007
Gender Inequality Index	51.69	28.48	-3.727	<.001		.27	.08	9.602	.002
GNI Per Capita (PPP)	40.18	62.25	3.513	<.001		19,138.01	47,911.57	7.181	.007
Hofstede Individualism	33.99	53.77	3.524	<.001		42.00	72.50	5.181	.023
Income Equality (share of bottom 50%)	40.43	61.56	3.365	<.001		.1450	.2021	7.181	.007
Infant Mortality (per 1,000 live births)	51.24	31.38	-3.162	.002		10.90	3.45	3.818	.051
Life Expectancy (years)	41.31	59.08	2.828	.005		74.58	82.02	7.181	.007
Maternal Mortality (per 100,000 live births)	50.89	30.67	-3.248	.001		38.69	7.20	6.875	.009
Unintended Pregnancy Rate (per 1,000 women)	44.73	29.17	-2.772	.006		64.23	33.83	9.649	.002

Note. Shaded cells are not statistically significant at $\alpha = .05$

Table A6. Nonparametric Tests by Public Assurance Program (No/Yes)

	Mann-Whitney U Test					Median Test			
Variable	**No Mean Rank**	**Yes Mean Rank**	**Test Statistic**	**P**		**No Median**	**Yes Median**	**χ^2 Yates's**	**P**
Abortion Rate (per 1,000 women)	49.04	18.00	-5.461	<.001		30.16	10.27	28.910	<.001
Adolescent Births (per 1,000 women)	55.92	22.48	-5.517	<.001		35.31	7.07	20.447	<.001
Birth Rate (per 1,000 people)	55.05	24.56	-5.031	<.001		15.70	9.10	24.809	<.001
Cantril Ladder (life satisfaction ranked 1-10)	35.34	61.33	4.480	<.001		5.84	6.72	10.581	.001
Child Poverty (% income < $3.65 per day)	47.58	17.65	-5.552	<.001		9.13	.30	26.209	<.001
Child Poverty (% income < 1/2 of median)	30.74	16.24	-3.708	<.001		19.13	10.30	13.339	<.001
Corruption Perception Index	36.11	67.41	5.210	<.001		37.67	62.00	25.608	<.001
Divorce Rate (per 1,000 people)	23.31	29.69	1.519	.129		1.57	1.85	3.769	.052
Education (years)	36.22	69.19	5.439	<.001		9.10	12.92	17.632	<.001
Female Labour Force Participation (%)	43.86	51.07	1.190	.234		53.23	55.77	.972	.324

Female Seats in Parliament (%)	4214	53.33	1.862	.063		26.27	33.08	3.386	.066
Female Some Secondary Education (%)	36.99	67.35	5.009	<.001		65.55	95.50	17.632	<.001
GDP Per Capita (USD)	36.33	68.93	5.378	<.001		6,897.17	32,394.68	31.092	<.001
Gender Inequality Index	56.34	20.20	-6.014	<.001		.37	.07	30.476	<.001
GNI Per Capita (PPP)	36.38	68.81	5.352	<.001		14,927.75	43,588.26	36.421	<.001
Hofstede Individualism	30.14	58.98	5.299	<.001		34.50	69.00	23.287	<.001
Income Equality (share of bottom 50%)	35.48	70.94	5.853	<.001		.1348	.2043	31.092	<.001
Infant Mortality (per 1,000 live births)	56.87	20.24	-6.043	<.001		11.97	3.08	28.156	<.001
Life Expectancy (years)	37.48	66.19	4.735	<.001		73.57	82.24	13.988	<.001
Maternal Mortality (per 100,000 live births)	56.03	20.93	-5.842	<.001		65.75	4.82	30.476	<.001
Unintended Pregnancy Rate (per 1,000 women)	48.59	19.09	-5.191	<.001		67.00	28.98	28.910	<.001

Note. Shaded cells are not statistically significant at $\alpha = .05$

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