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RESEARCH ARTICLE

The impact of Immigration Policy on future US population size

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Abstract

Immigration will be the key factor determining whether populations in the developed world increase or decrease over the coming century. New policy-based population projections illustrate this for the United States. Expansive immigration policies could increase the US population by hundreds of millions by 2100, while more restrictive policies could lead to population stabilisation or significant reductions. For the US, there is no plausible high-immigration path to a sustainable population. Because larger populations increase human environmental impacts, sustainability advocates in the US and other countries with high net immigration levels have strong prima facie *reasons to support immigration reductions. Such reductions could achieve smaller populations in receiver countries and encourage smaller populations in sender countries, contributing to global ecological sustainability.*

Keywords: immigration, population, overpopulation, population projections, sustainability

Introduction

Population size is a key factor determining people's environmental impacts and immigration is a key factor determining the size of human populations. Given

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that, environmentalists seeking to create sustainable societies have a *prima facie* stake in immigration policy. This is particularly true in much of the developed world, where mass immigration drives continued population growth (Parr, 2021; Parr, 2023). In many developed countries, decades of below-replacement fertility levels have not led to population stabilisation or decline. Instead, increased immigration has resulted in continued population growth in the United States, Canada, Australia, France, the United Kingdom, Sweden, the Netherlands and many other wealthy countries (United Nations, 2024).

Having failed to address population matters in recent decades, some environmentalists take comfort in official projections that show populations peaking later this century and then declining, globally or nationally. For example, the United Nations' *World Population Prospects 2024* predicts peak global population by the mid-2080s, while the US Census Bureau's 2023 'main series' projection has the US population peaking in the late 2070s. This complacency is misguided for several reasons.

First, these projected trends assume policy changes that may or may not happen. In the case of the UN projections, this includes greatly expanding contraceptive availability and greatly improving educational opportunities for girls in the developing world, particularly in sub-Saharan Africa (Kebede et al., 2019; Götmark and Andersson, 2022). The US Census Bureau's projections assume large decreases in net migration into the US from current levels (Knapp and Lu, 2022; US Census Bureau, 2023b). There is no consensus on these policy changes and indeed significant resistance to them. At a minimum, they will take considerable effort to achieve.

Second, stabilising global and national populations at current levels, or even modestly decreasing them, appears insufficient to avoid continued ecological degradation and potential catastrophe. All indications are that a global population of 8 billion people is three to four times more than Earth can sustain over the long term, at least at the levels of comfort and convenience experienced in prosperous industrial democracies and desired in poorer nations (Lianos and Pseiridis, 2016; Dasgupta, 2019; Tucker, 2019). A population of 340 million in the US is probably several hundred million more than can share the temperate North American landscape justly with other species or avoid taking more than our fair share of global resources (Rosenberg et al., 2019; Pimentel and Pimentel, 2006).

There is no lack of schemes for solving environmental problems without addressing overpopulation. Selfish and dangerous proposals are made to geoengineer Earth's atmosphere or oceans to allow continued economic and demographic growth (Stephens et al., 2023). Two recent studies assert humanity's ability to feed 10 billion people; all we need to do is completely reinvent global agriculture (Gerten et al., 2020; Springmann et al., 2018). But whatever might be possible hypothetically in the future, a warming atmosphere, melting tundra, burning forests, shrinking and dying rivers, acidifying oceans, bleaching corals and dwindling wildlife all testify to humanity's excessive numbers today (Ripple et al., 2020; Richardson et al., 2023). We are grossly overpopulated now, here, in the actual world we love and completely depend upon (Götmark et al., 2021). While 'End Population Growth!' was the right slogan in 1970, with more than twice as many people alive today, living much more luxuriously on average, environmentalists' new goal should be to gradually and humanely shrink human numbers (Crist et al., 2022).

Understanding the impact of immigration policy on future population numbers helps clarify developed nations' economic and environmental policy choices going forward. That is what I seek to do for the United States in what follows, building on recent US Census Bureau projections to make explicit where future immigration policy choices may lead.

Recent Census Bureau projections

In 2023, the US Census Bureau provided their most recent population projections for the United States (US Census Bureau, 2023a). They used a standard cohort-component method; for details, see 'Methodology, Assumptions, and Inputs for the 2023 National Population Projections' (US Census Bureau, 2023b). The Census Bureau's main projection series set the total fertility rate (TFR) between 1.63 and 1.54 from 2025 to 2100, slowly decreasing over the entire period. Average life expectancy varied between 76 and 86 years for men and 81 and 88 years for women, slowly increasing over the entire period. Net annual migration levels varied between 853,000 and 976,000, peaking in 2079 and decreasing slightly thereafter.

These projections garnered the most attention for predicting that the US population would peak in the late 2070s and then start to decrease, a first for a Census Bureau main projection. This became 'Census Bureau Says US Population to Decline' in headlines and TV news stories around the country, fitting in nicely with recent concerns about falling national fertility levels (Bahrampour, 2023;

Schoichet, 2023). Reports downplayed that this decline was predicted to occur more than fifty years in the future and that the expected US population in 2100 was tens of millions larger than it is now. Some reporters framed their stories as America 'running out of people' or, especially in the business press, 'running out of workers' (Wise, 2023). Also often highlighted was population ageing.

The Census Bureau also provided projections under 'zero', 'low' and 'high' immigration scenarios, along with their most likely 'main series' projection (see Table 1). These alternative scenarios were largely ignored by reporters. Net migration under the main series averages 939,000 annually over the projection period. Net migration under the low and high immigration scenarios averages 543,000 annually and 1.534 million annually, respectively. The 'zero' migration scenario actually models an average -249,000 annual net *negative* migration, since it combines continued emigration out of the country with no immigration whatsoever (a highly unlikely scenario). These four immigration scenarios yielded populations of 226 million, 319 million, 366 million and 435 million in 2100 (US Census Bureau, 2023a).

Table 1. Projected US Population Size Under Four Different Immigration Scenarios, 2023–2100 (numbers in thousands)

Year	Main Series	Alternative Foreign-born Immigration Scenario		
		Low Immigration	High Immigration	Zero Immigration
	Population	Population	Population	Population
2023	334,906	334,394	335,675	333,369
2030	345,074	340,921	351,303	332,615
2040	355,309	345,605	369,865	326,196
2050	360,639	345,029	384,054	313,807
2060	364,287	342,510	396,954	298,951
2070	367,913	339,715	410,209	283,313
2080	369,363	334,795	421,213	265,650
2090	368,120	327,447	429,130	246,084
2100	365,558	319,032	435,346	225,961

SOURCE: US CENSUS BUREAU, '2023 POPULATION PROJECTIONS FOR THE NATION BY AGE, SEX, RACE, HISPANIC ORIGIN AND NATIVITY,' TABLE A (MODIFIED).

On the positive side, these alternative projections did show readers who dug deeply enough that immigration levels will make a big difference in future US population numbers, especially since the Census Bureau projected all the way up to 2100, something it had not done since 2000. The difference between expected populations in 2100 for the low immigration and high immigration projections was 116 million (319 million versus 435 million). In a press release, the Census Bureau stated explicitly: 'In each of the projection scenarios except for the zero-immigration scenario, immigration is projected to become the largest contributor to population growth'. And: 'Different levels of immigration between the present and 2100 could change the projection of the population in that year by as much as 209 million people, with the projected total population ranging anywhere from 226 to 435 million' (US Census Bureau, 2023c).

A problem with the Census Bureau projections, however, is that they do not accurately capture the range of immigration policy choices facing the United States today. Just in the past five years, net immigration into the United States has varied more widely and across a much higher range, from 750,000 in the last year of the first Trump administration (2020) to approximately 3 million in Joe Biden's penultimate full year as President (2023) (Knapp and Lu, 2022; Camarota and Ziegler, 2024). This is a variance of 2.25 million, compared to a variance of 0.9 million between the Census Bureau's low immigration and high immigration projections. Such a failure to consider the full range of immigration policy options is common in national statistical bureaus' population projections, which have been slow to accommodate recent large increases in immigration (Cafaro and Dérer, 2019).[2]

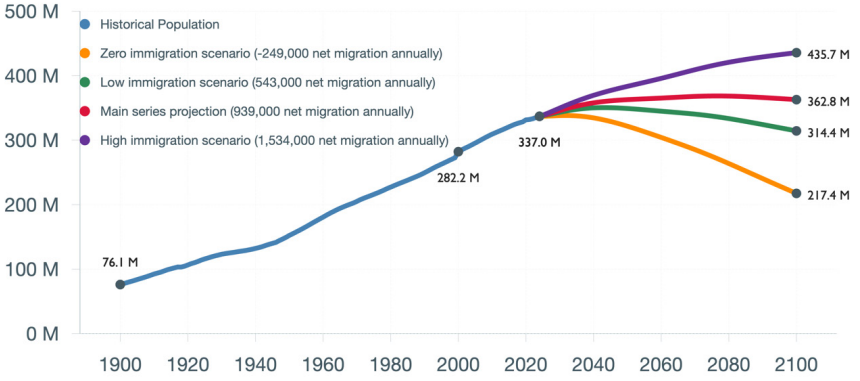
In an effort to correct this failure, I created a population projection tool to model the full range of immigration choices facing American policymakers. This tool replicates the cohort-component method used by the Census Bureau, utilising

2 As another example, in 2015 Destatis, Germany's national statistical bureau, came out with population projections that considered two annual net migration scenarios, 100,000 and 200,000 (Federal Statistical Office of Germany, 2015). These two immigration scenarios hardly accounted for the range of policy choices facing a country where annual net immigration had averaged 259,000 over the previous twenty years and varied widely (from – 56,000 in 2008 to 1.2 million in 2015) and where there was widespread support both for greatly increasing immigration (Social Democrats, *Die Grünen*) and greatly decreasing it (Christian Democratic Union, *Alternative für Deutschland*).

a single-cohort model. It uses initial population data from the Census Bureau as of July 2024 and migration, fertility and mortality data from the 2023 Census Bureau projections. I set the tool to default to the Census Bureau's 2023 main series projection values for total fertility rate, life expectancy and net migration between 2025 and 2100, all of which can then be varied to create new projections.

Using these default parameters from the main series, this 'reverse engineered' projection tool generates a US population in 2100 of 362.8 million, less than 1 per cent different than the Census Bureau's main series projection of 366 million (US Census Bureau, 2023a). Most of this difference appears to be a function of using a more up-to-date base population. Rerunning the Census Bureau's four immigration scenarios from 2023 using this tool generates the projections in Figure 1.

Figure 1. US population projections to 2100 (in millions) under Census Bureau's four immigration scenarios

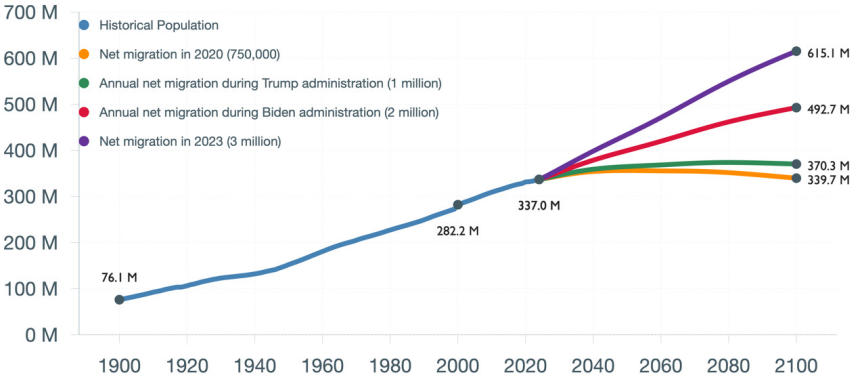


SOURCE: US CENSUS BUREAU, '2023 POPULATION PROJECTIONS FOR THE NATION BY AGE, SEX, RACE, HISPANIC ORIGIN AND NATIVITY' AND OWN CALCULATIONS.

Note that the range between the populations in 2100 under the high immigration and low immigration scenarios is only 121.3 million. Adding the zero-migration projection increases the range to 218.3 million, but this is a highly unlikely scenario which doesn't increase the range of plausible policy options.

By comparison, projecting out scenarios based on the actual figures for net migration in 2020 and 2023, 750,000 and 3 million respectively, leads to a difference of 275.4 million in 2100 (see Figure 2). In the high immigration scenario, the US population balloons to 615.1 million by 2100, while in the low immigration scenario population rises at first and then declines slowly over the second half of the century to 339.7 million – essentially today's number. Even comparing two scenarios for estimated average annual net migration under the Trump and Biden administrations – approximately 1 million and 2 million, respectively (Camarota and Ziegler, 2023) – we still see a 122.4 million difference between projected populations in 2100 (492.7 million versus 370.3 million). Both generate continued US population growth, but one scenario leads to four and a half times as much growth as the other, and a population that would still be rapidly growing at the end of the century.

Figure 2. US population projections to 2100 (in millions) at recent immigration levels



SOURCE: US CENSUS BUREAU, '2023 POPULATION PROJECTIONS FOR THE NATION BY AGE, SEX, RACE, HISPANIC ORIGIN AND NATIVITY' AND OWN CALCULATIONS.

As the Census Bureau itself emphasised, with historically low fertility rates unlikely to rebound to previous levels, immigration policy likely will be the main determinant of whether the US population will continue growing in the twenty-first century and by how much (US Census Bureau 2023a, 2023c). For those who believe achieving sustainability depends on ending or reversing population growth, wading into immigration policy thus appears unavoidable.

Recent immigration policy

Recent variations in immigration levels have been caused by a wide range of immigration policy changes. Legal immigration under congressionally mandated programs has stayed relatively stable around 1.1 to 1.2 million annually, not just during the Trump and Biden administrations but since the last major increases in legal immigration levels in the early 1990s. What changed dramatically during the past decade have been four things: decreased (Trump) and then increased (Biden) tolerance for illegal immigration; the Covid pandemic; an immense surge in political asylum applications; and new 'temporary' parole programmes bringing in several million citizens from distressed states in Latin America (Camarota and Ziegler, 2024).

In 2017, the Trump administration became the first Republican administration since the 1950s to seriously attempt to reduce illegal immigration. Efforts included the 'Remain in Mexico' policy, under which asylum applicants entering the US illegally were returned to Mexico to await adjudication of their claims; increased enforcement of employer violations of worker visa programs; a temporary suspension of foreign aid to several Central American countries to compel them to cooperate with repatriation efforts; and more (Bolter et al., 2022). These endeavours garnered mixed success, yet they did reinforce the ideas that limiting immigration is necessary and that immigration limits should be enforced (Kaba, 2019). Illegal immigration into the US decreased marginally during Trump's first term, while legal immigration levels remained steady. Covid-19 did more to reduce overall immigration levels, however, with 2020 recording some of the lowest numbers seen in decades (Knapp and Lu, 2022).

In response, from 2021 onward the Biden team went further than any modern American administration in relaxing immigration enforcement. 850,000 visitors overstayed their visas and remained in the US illegally in 2022 (US Department of Homeland Security, 2023). Nearly 1.4 million prima facie inadmissible migrants were released by federal officials into the country in fiscal year 2023, many after filing bogus political asylum claims (Arthur, 2023). During the administration's first three years, two million people from faltering and failed states were 'paroled' into the US under special programs originally designed to accommodate a few hundred people (Arthur, 2024). More recently, after a public outcry and with an impending Presidential election, these numbers were brought

down. But they represent an unprecedented increase in illegal and quasi-legal immigration which, added to stable levels of legal immigration, has led to the highest absolute net migration levels in US history.[3]

What can we conclude from the policy actions taken in the past eight years and the public's response? First, most Americans believe that citizens through their elected governments should set and enforce limits to immigration, but significant minorities on the cosmopolitan left (Dummett, 2024) and libertarian right (Kukathas, 2021) disagree. There really is a constituency for 'open borders'. Second, according to recent polls, a majority of Americans have come to believe that current immigration levels should be reduced. Most of the rest think current levels are acceptable, while only a small minority believe they should be expanded (Jones, 2024). Third, these proportions are largely reversed among the political and business elites that actually run the country. A majority of these decision-makers support continued high levels of immigration or even more expansive policies. That is why immigration levels stay high and tend to go higher. As Gilens and Page (2014) have demonstrated for a wide variety of policy issues, when public opinion conflicts with the economic interests of the wealthy, the latter almost always win out in American politics.

In sum, there are wide divergences in the immigration policies pursued and enacted within the United States. Policy analysts should grapple with the full range of policy proposals, including their demographic and environmental implications. The goal of official population projections should be to clarify those implications for informed citizens, although they often fail to do so (Cafaro and Dérer, 2019; O'Sullivan, 2020).

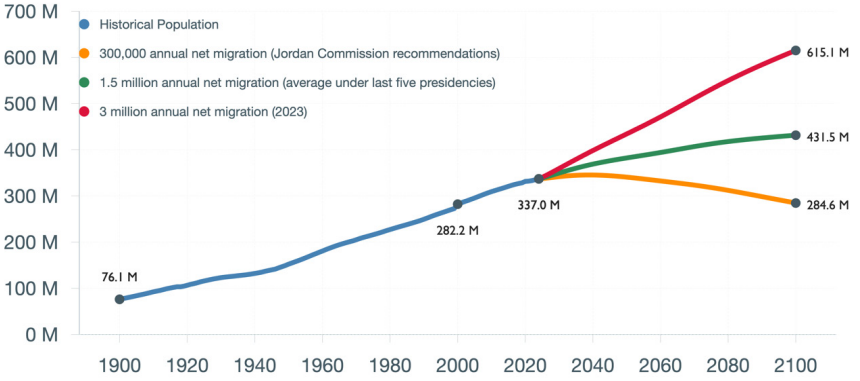
New policy-based population projections

Let's compare three scenarios that begin to capture the actual immigration policy choices facing the United States. Using the Census Bureau's (2023b) methodology, we first graph a rough 'status quo' scenario of 1.5 million annual net migration,

3 Legal and illegal immigration have become blurred categories in recent years in the United States, as Democratic administrations have become increasingly comfortable allowing illegal immigration and promoting new immigration pathways outside Congressional mandates. 'Quasi-legal' seems like a useful term to capture some of what is happening; President Biden's massive parole programs, for example, which extended far beyond Congress' original intent and are subject to ongoing litigation.

the average over the eight administrations of the past five US presidents, from 1992 to the present. Projected forward, this immigration level leads to substantial population growth throughout this century (Figure 3). We then compare this scenario to one based on the immigration levels recommended by the US Commission on Immigration Reform (1997) (commonly known as the Jordan Commission) and endorsed by President Clinton (300,000 annual net) and to the highest annual net immigration level under the Biden administration (approximately 3 million). The Jordan Commission recommendations have been endorsed by numerous advocacy groups; they reduce immigration levels substantially, while leaving some room for bringing in exceptional workers, genuine political refugees and spousal reunification. The Biden administration's numbers for 2023 stand as the high-water mark for immigration permissiveness, providing an empirically-grounded high-migration comparison to the status quo scenario.

Figure 3. US population projections to 2100 (in millions) under three different immigration policies



SOURCE: US CENSUS BUREAU, '2023 POPULATION PROJECTIONS FOR THE NATION BY AGE, SEX, RACE, HISPANIC ORIGIN AND NATIVITY' AND OWN CALCULATIONS.

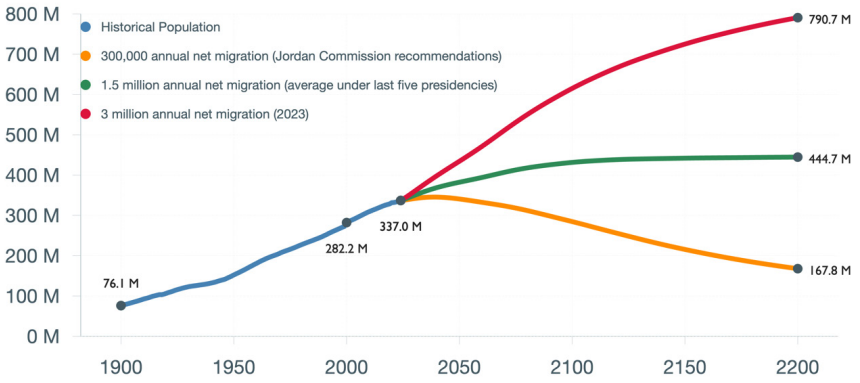
These three policy scenarios put the United States on three very different population trajectories: rapid growth, gradual growth or gradual decline. They differ in their 2100 population projections by 330.5 million – very close to the entire population today. Once again, we see that immigration policy *is* population policy in the United States, as it is throughout most of the developed world. The

environmental difference between a population of 615 million or 285 million in 2100 would be immense, impacting everything from carbon emissions to urban sprawl, air pollution to water withdrawals from our rivers and streams, habitat preservation for endangered species to housing costs and crowding for American citizens (Kolankiewicz et al., 2016).

All else being equal, we can assume that 615 million Americans will make more than twice the economic demands and inflict more than twice as much ecological damage as 285 million Americans. Furthermore, these populations would continue increasing or decreasing after 2100, if their respective immigration, fertility and mortality trends continued. This in turn would move Americans even further away from or further toward ecological sustainability. Under a post-2100 continuation of the high immigration scenario, the US population of 337 million in 2024 would double in a hundred years, increasing to 674 million by 2124.

Figure 4 below extends these three immigration policy scenarios out another hundred years to 2200. From where we sit now, this is looking out the 'seven generations' that far-seeing leaders of the Iroquois Confederacy were supposed to scan when making important public decisions (assuming 25 year-long generations). What do we see? Three radically different population futures.

Figure 4. US population projections to 2200 (in millions) under three different immigration policies



SOURCE: US CENSUS BUREAU, '2023 POPULATION PROJECTIONS FOR THE NATION BY AGE, SEX, RACE, HISPANIC ORIGIN AND NATIVITY' AND OWN CALCULATIONS.

Under the status quo scenario (1.5 million annual net migration), the US population grows slowly during the rest of this century and stabilises over the course of the next one. But it stabilises at over one hundred million more Americans than today (444.7 million in 2200). This population is almost surely unsustainable. Accepting hundreds of millions of immigrants over this period could also incentivise continued population growth in sender countries, since large families are likely to derive more support from overseas remittances, a major economic factor in many developing countries (Tohoff et al., 2024). The status quo scenario does not appear sustainable.

Under the high-level immigration scenario (3 million net annually), the US population continues to grow rapidly during the next two centuries, ballooning to nearly 800 million people with no end to growth in sight. Long before 2200, the American experiment may have come to an end, whether from ecological catastrophe or social unrest, amplified by growing ethnic divisions and an unravelling economic safety net (Rees, 2020). This choice seems even less likely to be sustainable.

Finally, under the low immigration scenario (300,000 annually), the US population declines by half by 2200 to 167.8 million. Of course, by itself such population decline would not guarantee sustainability – US citizens could try to use the ecological space freed up to engage in even greater *per capita* hoggishness. Even 168 million Americans still seems likely to remain unsustainable, given high levels of per capita resource use (Pimentel and Pimentel, 2006). But as part of comprehensive efforts to create a sustainable society, the potential benefits of halving the US population would be immense. An America closing in on 150 million (rather than 800 million!) could use less water, generate less air and water pollution and take less habitat from other species (Attenborough, 2011). In fact, it would be in prime position to restore degraded ecological lands, particularly agricultural lands no longer needed to feed so many human beings (Weber and Sciubba, 2018). This is the only potentially sustainable path of the three.

Encompassing the full range of possible policies

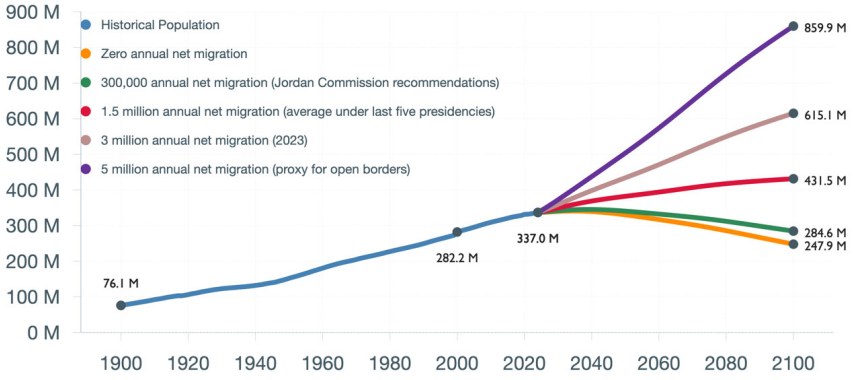
As wide-ranging as they are, the previous scenarios do not exhaust the full range of potential immigration policy scenarios seriously advocated in the United States. Figure 5 graphs two new scenarios: a zero annual net migration scenario and a 5 million annual net migration scenario. Zero net migration represents even greater immigration curtailment than the Jordan Commission's recommendations; it is supported by a substantial minority of Americans, such as those who argue for

an 'immigration pause' while the country assimilates the large waves of recent immigrants (Cafaro, 2015). Including zero net migration also has the virtue of clarifying migration's contribution to population growth under all other scenarios (subtract the population under the zero net migration scenario from that under other scenarios, at whatever year, and you will see net migration's contribution to the total population under that scenario).

At the other end of the spectrum, a minority of Americans support letting anyone immigrate into the country who wants to do so, or at least anyone without a serious criminal history. Polls routinely show an immense pent-up demand for emigration from the developing world. In 2021, Gallup estimated nearly 900 million adults in low- and middle-income countries wished to emigrate permanently from their home countries, with 160 million of them having the US as their preferred destination (Pugliese and Ray, 2023). So the *supply* is there – as is the *demand* from corporate interests for cheap and docile labour. For many years, the *Wall Street Journal* editorial page has advocated for a simple, five-word amendment to the US Constitution: 'There shall be open borders'.

An open borders immigration policy is difficult to model. Presumably, it would lead to large yet widely fluctuating numbers from year to year. In Figure 5 below, 5 million annual net migration stands in as a rough proxy for open borders. How long such

Figure 5. US population projections to 2100 (in millions) under five different immigration policies



SOURCE: US CENSUS BUREAU, '2023 POPULATION PROJECTIONS FOR THE NATION BY AGE, SEX, RACE, HISPANIC ORIGIN AND NATIVITY' AND OWN CALCULATIONS.

a policy could actually continue before devolving into chaos is an open question. Nevertheless, it is espoused by millions of Americans, both on the left and the right, so it is worth considering what a *de facto* open borders policy might entail.

Projecting this spectrum of policy choices shows once again the immense demographic importance of immigration policy. Populations in 2100 range from 859.9 million under the open borders scenario, an increase of 522.9 million over 2024 (> 255%), to 247.9 million under zero annual net migration, a decrease of 89.1 million (< 24%). Population in 2100 ranges over 612 million between the highest and lowest scenarios. This shows the power of relatively small annual differences in annual net migration to cause huge differences in the US population in less than one hundred years.

Projecting all five immigration scenarios out another hundred years to 2200 ('seven generations') increases the population range in 2200 to 1.1536 billion (from 98.6 million to 1.2522 billion). Of course, demographers rarely project out that far. But if we want to create societies that actually are sustainable, we need to think long-term. Even restricting ourselves to the next 75 years, comparing population increase under the status quo scenario (1.5 million annual net migration) and under the net zero scenario, we see that continuing immigration at recent levels could add another 183.6 million people to the US population by 2100. That's equal to the entire US population in 1962.

Discussion

Intelligent discussion of immigration policy rarely occurs in American politics these days. There exists little room for it, between Republicans' claims that immigrants are eating people's pets, Democrats' insistence that adding millions of new residents every year has no negative effects on housing or labour markets and environmentalists' refusal to consider the impacts of population growth. The policy-based population projections presented here are a modest attempt to set aside nonsense and hyperbole and make intelligent dialogue possible. Here I focus on immigration's environmental implications, recognising that a comprehensive discussion must also incorporate additional issues.

Considering these projections, a case can be made that immigration policy choices will be more consequential than any other environmental policy decisions in the US

going forward. Energy policy, agricultural policy, transportation policy – all will still be important. But energy demands, food demands and transportation demands will be determined in substantial part by the number of Americans (Foreman and Carroll, 2014). It seems clear that serious environmentalists cannot ignore immigration policies that will greatly scale up Americans' total environmental impacts, both nationally and globally. Given immigration's demographic importance, the same point appears to hold across much of the developed world. Even if we wind up endorsing continued high levels of immigration, for humanitarian or economic reasons, we should recognise its environmental costs (Hardin, 1995).

Fewer people is the environmental gift that keeps on giving. Particular technological fixes or policy changes may limit carbon emissions, decrease water use, curb overhunting or reduce plastics pollution. But smaller populations help with all our environmental problems: every single one, simultaneously, and without any adverse environmental countereffects (Crist et al., 2022).[4] Declining populations certainly pose economic challenges, but these challenges are manageable, particularly compared to runaway climate change or other global environmental disasters (Götmark et al., 2018; Lianos et al., 2023.). Meanwhile, growing populations reduce the positive impact of any technological fixes we manage to deploy.

If avoiding ecological catastrophe is the primary economic challenge of the twenty-first century, the unremitting deluge of bad environmental news from around the world is powerful evidence of the need to significantly reduce human numbers (Bradshaw et al., 2021; Rees, 2023). I would defend 100 million Americans and a global population of 2 billion as reasonable, precautionary long-term targets. In a world in rapid ecological decline (Richardson et al., 2023), 340 million Americans and 8 billion earthlings stand as gross *over*populations until proven otherwise – not in some techno-optimist manifesto (Asafu-Adjaye et al., 2015) or socialist pipe dream (Angus and Butler, 2011), but by actual economic behaviour in the real world.

4 This contrasts, for example, with solar geoengineering and increased use of nuclear power, two common technological fixes proposed to deal with climate change. Even if they succeed in their particular goals – a big if – they will have significant environmental costs. Furthermore, even if their overall benefits exceed their overall costs, by prolonging the endless growth economy they increase the likelihood and potential severity of a global ecological crash.

It should not be necessary to defend the obvious fact that more people increase human economic demands and environmental impacts, while fewer people decrease them. This has already been fully proven for climate change (IPCC, 2022), biodiversity loss (IPBES, 2019) and comprehensive ecological degradation (Reid et al., 2005). I do not attempt to quantify those demands and impacts under different US demographic scenarios in this paper, although I would welcome efforts to use these projections to do so. An earlier publication did this for the European Union, focusing on greenhouse gas emissions and biodiversity preservation (Cafaro and Götmark, 2019). However, given the complexity of human environmental impacts and the uncertainty of future trends in energy and materials use, transportation modes and agricultural techniques, such speculations are somewhat uncertain.

This uncertainty can bolster status quo bias – but the demographic status quo is leading to potential ecological disaster. So let me suggest two reasonable assumptions to guide developed nations' future immigration policy choices. First, that future citizens will make substantial per capita environmental demands on the Earth, just as we do, regardless of fantasies of 'full decarbonisation', 'dematerialisation' and the like. Second, that going forward, twice as many people will generate approximately twice as many demands as half their number would have. Deviations from these assumptions seem to me unwarranted, mere special pleading by those wedded to the economic status quo or committed to high levels of immigration (or fertility) for ideological or self-interested reasons that preclude an honest reckoning with ecological limits.

To be clear, reducing human numbers is no environmental panacea. Efforts to shrink populations should be part of comprehensive strategies to create sustainable societies, with economies based on reasonable comfort and security rather than ever-increasing wealth and consumption (Daly and Farley, 2010). Creating such societies will need to include reining in the power of large corporations, phasing out dangerous technologies and deploying more benign ones, setting aside more habitat and resources for other species, and decreasing per capita consumption, especially among the wealthy (Crist, 2019). Population reduction complements these other measures. It is not a substitute for them.

Notwithstanding techno-optimists on the one hand and ecosocialists on the other, smaller populations appear to be a necessary (but not sufficient) condition

for creating sustainable societies. In part, that's because both human cleverness and human solidarity are limited. In part, it's because increasing either per capita economic demands or the number of 'capitas' can push environmental impacts too far.

Gandhi famously said that Earth provides sufficient resources to satisfy every man's needs, but not every man's greed. When the Mahatma published those words in 1909 in *Hind Swaraj*, the world's population stood around 1.6 billion and India's at perhaps 250 million. Are they still true today at 8 billion and 1.4 billion, respectively? Probably not – at least not if we expand 'needs' beyond bare physical needs to include the common consumer goods and material comfort that most people around the world appear to want. True, creating sustainable economies will depend on people's willingness to distinguish essentials from inessentials, needs from at least some of our wants, and then limiting consumption and production accordingly. But setting such limits remains largely unexplored politically. Citizens' willingness and politicians' ability to set them remains unproved, to put it mildly.

In such a fraught situation, threatened by our own 'too much' but reluctant to accept less, it seems especially futile to espouse economic degrowth while denying the most effective and least painful way to shrink economic activity: reducing the number of consumers and producers. Yet incredibly, some leading degrowth advocates do just that (Kallis, 2019), often resorting to *ad hominem* attacks against supporters of population reduction (Monbiot, 2020). Degrowth proponents are right: we will need to decrease the size of industrial economies to achieve ecological sustainability. Mere efficiency improvements will not do the job, *cannot* do it in a context of endless economic growth. Environmental advocates will have to convince our fellow citizens to accept limits to their consumption and their pursuit of wealth. But while we are doing that, we cannot afford to turn up our noses at the one important component of degrowth that most people in the developed world have embraced already: having small families, which can humanely shrink human numbers going forward.

Conclusion

We rightly hear a lot today about the outsized role developed nations have played in causing global climate change and their responsibility to take the lead in responding to ecological overshoot. But if they are to share the world's

resources more fairly and show the way forward by creating prosperous yet sustainable societies, developed nations must reduce their bloated populations (among other measures, to be sure). The path to doing so is open. For two or three generations, citizens in the developed world have freely chosen to have the small families that would have allowed national populations to decrease gradually and relatively painlessly – while many of their governments have greatly increased immigration, leading instead to continued population growth in many countries.

Such high immigration levels are broadly unpopular, as shown most strikingly in 2016 by Brexit and the election of Donald Trump as US President (and by his re-election in 2024). Perhaps the twin threats of ecological collapse and the triumph of far-right political parties may convince mainstream politicians to finally accept reductions in immigration. Perhaps ending (and then reversing) population growth could be the first step in slowing (and eventually reversing) economic growth – our only hope for avoiding catastrophic climate change and mass species extinction and creating genuinely sustainable societies. Then again, mainstream political leaders may continue to bleat about these 'existential threats' while making them worse by ratcheting up immigration levels, as has occurred in the US and the UK since 2016.

The most plausible, and ethical, path toward lower national populations in the United States and throughout the developed world involves accepting historically low fertility rates, rather than fighting them, while also ending mass immigration. This appears to be the way forward to create flourishing societies that are both just and ecologically sustainable. Sustainable societies must take limits seriously. That necessarily includes limiting human numbers, along with our associated economic activity. In an overcrowded world, that goal necessarily requires limiting immigration.

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