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Reflection

The demography of loneliness: Rethinking social connections in population research

Hisrael Passarelli-Araujo

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Abstract

BACKGROUND
Loneliness is often treated as an individual or psychological experience, but it also reflects broader demographic and structural shifts. Population aging, declining fertility, migration, and shifting household arrangements have reshaped the ways individuals connect, care, and live. Despite its growing social relevance, loneliness remains under-theorized and under-measured in demographic research.

OBJECTIVE
This essay outlines why loneliness should be understood as both a consequence and a driver of demographic change. It examines how relational disconnection interacts with fertility, mortality, and migration across the life course, and offers a demographic framework for studying loneliness as a population process.

RESULTS
Loneliness emerges from demographic transitions (declining fertility, rising childlessness, increased longevity, and new migration regimes) that shape how people connect and care. In turn, loneliness influences demographic behaviors and outcomes, from reproductive intentions and union formation to survival, health, mobility, and return migration. These dynamics operate within cohorts and can accumulate across generations.

CONCLUSIONS
Integrating loneliness into demographic models and data systems enhances the field's ability to characterize population vulnerability and inform policy. Counting connection and disconnection alongside births, deaths, and moves improves our understanding on how people live and whether they thrive.

CONTRIBUTION
This essay contributes to demographic theory by articulating a framework that situates loneliness as both a cause and a consequence of demographic change. It bridges literatures on demography, well-being, and population dynamics to propose a

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demographic lens for understanding social disconnection across different contexts and life stages.

1. Introduction

Loneliness is often described as a private feeling or a psychological state, but its roots and consequences extend far beyond individual experience. It is formally defined as the distress that arises when one's social relationships are perceived as insufficient in quality or quantity (Perlman and Peplau 1981). This experience takes shape within the demographic, social, and institutional contexts in which people are born, form relationships, move, care, and age (Holt-Lunstad 2021). As population aging accelerates, fertility declines reshape family structures, migration redistributes social networks, and living alone becomes more common, loneliness increasingly mirrors the rhythms and pressures of demographic change. Despite this, it remains under-theorized and under-measured in population science.

Global evidence suggests that this oversight is no longer tenable. Nearly 1 in 4 individuals worldwide reported feeling very or fairly lonely in 2023 (Gallup 2023). Such levels indicate that loneliness is not an exceptional condition, but a widespread experience influenced by demographic forces such as fertility decline, migration flows, residential sorting, and changing partnership and living arrangements (McKenna-Plumley et al. 2023; Passarelli-Araujo 2025).

Demographers have not ignored loneliness. A growing body of research has addressed loneliness in later life, its links to mortality, and its variation by gender, household structure, and migration background (van den Broek and Grundy 2017; Chan et al. 2015; Newmyer et al. 2022; Raymo and Wang 2022; Raz-Yurovich 2025). For instance, Raymo and Wang (2022) introduced the concept of 'lonely life expectancy', highlighting disparities in loneliness across sex, race/ethnicity, and education among older Americans. Newmyer et al. (2022) further advanced the field by applying the theory of demographic metabolism (Lutz 2013) to show how population aging and shifting age–sex structures shape national profiles of loneliness. Still, much of the current work remains focused on correlates rather than on the population processes that produce and reproduce loneliness across the life course.

This essay builds on this growing evidence to argue that loneliness is both shaped by and shaping demographic dynamics. The field has long explored topics such as the demography of happiness (Easterlin 2006; Lawrence, Rogers, and Wadsworth 2015) and the demography of families (Smock and Schwartz 2020; Teachman, Tedrow, and Kim 2013), both of which reveal how subjective and social life interact with demographic

behavior. Loneliness, however, is not simply the inverse of happiness nor a subset of family demography. It introduces a distinct challenge because it captures the ability to sustain meaningful connection under demographic conditions that are rapidly changing. This capacity is increasingly uneven as societies age, families contract, mobility intensifies, and new forms of digital and spatial separation emerge.

Understanding loneliness in demographic terms also requires moving beyond the boundaries of family. Although families remain central to demographic analysis, friendships, neighborhood ties, and community participation play an essential role in shaping daily life and care. When these networks erode, whether through fertility decline, migration, housing constraints, or spatial segregation, they signal deeper rearrangements in the relational systems that support reproduction, well-being, and survival.

Patterns of loneliness track demographic rhythms across the life course. They increase in young adulthood and again in older age, aligning with transitions into and out of education, partnership, parenthood, work, and care (Hutchison 2017; Nicolaisen and Thorsen 2014; Sheftel, Margolis, and Verdery 2024). Loneliness also reflects broader social inequalities. Economic insecurity, gender norms, household instability, and social exclusion shape who becomes lonely and under what conditions (Algren et al. 2020; Urbaniak et al. 2023). At the same time, loneliness exerts its own influence. It increases the risk of premature death (Holt-Lunstad et al. 2015), contributes to fertility decisions (Artamonova et al. 2024), affects mobility (Heu, van Zomeren, and Hansen 2020), and may increase demand for institutional care (Bilecen and Vacca 2021; Gao et al. 2024). In this sense, loneliness operates simultaneously as both outcome and determinant in population dynamics, a relational force embedded in the demographic metabolism itself.

The aim of this essay is twofold. First, it calls for the systematic inclusion of loneliness in demographic thinking as a measurable and policy-relevant indicator of well-being. Second, it examines how loneliness intersects with fertility and childlessness, mortality and health, and migration and displacement. Drawing on diverse disciplinary and geographic evidence, the essay outlines a demography of loneliness that treats emotional (dis)connection as a form of population infrastructure, shaping life course trajectories, care systems, and social inequality.[2]

More broadly, this essay encourages a subtle reorientation in demographic thinking: not away from what demographers already measure, but toward a broader recognition of how relational life conditions shape population outcomes. Just as demographers once expanded their purview to include education, disability, and gender equity, it is now time to reckon with relational well-being as a population concern. In so doing, demography

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[2] This essay is part of a broader research agenda on the demography of loneliness. Future stages of this project will involve empirical applications of the theoretical propositions discussed here, including comparative analyses across regions and demographic components such as fertility, mortality, and migration. This study therefore serves as the conceptual foundation for subsequent quantitative and mixed-method studies in this line of research.

can help describe the distribution of loneliness and engage more directly with the emotional foundations of how people connect, care, and grow older in the 21st century.

2. Background: Conceptualizing loneliness as a demographic issue

2.1 Definitional challenges and cross-cultural considerations

In demographic research, concepts such as fertility, mortality, and migration are defined with the goal of maximizing clarity and consistency. These events, while often embedded in complex life histories, typically involve observable transitions: a birth, a death, or a geographic move that implies change of residence (Siegel and Swanson 2004). Loneliness, by contrast, is fundamentally different. It is not a behavioral event but a subjective emotional state, shaped by individual perceptions of social relationships and expectations (Cacioppo et al. 2002; Newmyer et al. 2022; Perlman and Peplau 1981). For this reason, loneliness is analytically more challenging and conceptually less bounded than traditional demographic outcomes.

The most influential definition, proposed by Perlman and Peplau (1981), describes loneliness as the distress that arises when there is a perceived gap between the quantity or quality of desired and actual social relationships. The core of loneliness is therefore relational mismatch, not physical solitude. This distinguishes loneliness from social isolation, which refers to the objective lack or infrequency of social contact, and from solitude, which can be voluntary and restorative (Taylor et al. 2023). Loneliness is always involuntary and emotionally aversive (Dahlberg 2007). Clarifying these boundaries is essential because each construct has different determinants, consequences, and policy implications.

Measuring loneliness must account for different cultural contexts. Direct questions such as 'How often do you feel lonely?' are concise but prone to underreporting where stigma is strong. Indirect approaches, such as the UCLA Loneliness Scale (Russell, Peplau, and Cutrona 1980) or the De Jong Gierveld Scale (de Jong-Gierveld and Kamphuis 1985), use neutral wording to assess loneliness without naming it explicitly. These instruments include items like 'I feel left out' or 'There is no one I can turn to', allowing respondents to disclose loneliness-related sentiments in less stigmatizing terms. While these scales have been validated in many languages and settings, including adapted versions such as the UCLA-BR in Brazil (Barroso et al. 2016), they still require careful cultural adaptation.

Cultural and normative frameworks shape how loneliness is experienced and reported (Barjaková, Garnero, and D'Hombres 2023). Individualistic societies often normalize the open expression of emotional states, making self-reported loneliness more

visible (Schermer et al. 2023). By contrast, in collectivist contexts where family interdependence and community integration are highly valued, admitting loneliness may be associated with shame or social failure (Schermer et al. 2023; Wang, Fong, and Tripathi 2024). These norms shape both self-recognition and survey disclosure.

Cross-cultural research shows that loneliness emerges not simply from a universal deficit in relationships but from tensions between demographic change and cultural ideals of belonging. In Latin America, everyday sociability and the ethos of *convivência* (the value of living closely with others) can provide emotional protection but also hide relational fatigue, especially among women who bear disproportionate caregiving and emotional burdens within multigenerational households (Martinez-Marcos and De la Cuesta-Benjumea 2014; Rodríguez-Madrid et al. 2018). In Sub-Saharan Africa, communal philosophies like *ubuntu* historically anchored individuals in networks of reciprocity, but rapid urbanization and labor migration are weakening these relational systems, which may leave both migrants and older adults increasingly exposed to disconnection (Johnson 2025). Across Asia, declining fertility, internal migration, and shifting gender norms have reconfigured intergenerational living arrangements (Yeung and Cheung 2015). Older adults often age alone, and younger adults face time constraints and social pressures that limit collective engagement (Shorey and Chan 2021). These regional patterns share a common thread: Loneliness arises when demographic realities make cultural expectations about connection more difficult to sustain.

2.2 Life course theory and demographic research: Bridging disciplines

Understanding loneliness requires paying attention to how it unfolds over time and across changing social roles. Life course theory offers a framework for examining how relational experiences are shaped by timing, sequence, and context (McDonald and Mair 2010; Umberson, Lin, and Cha 2022; Urbaniak et al. 2023; Weiss, Lawton, and Fischer 2022). It views lives as sequences of linked stages, each influenced by historical context and by the distribution of opportunities and constraints across cohorts (Hutchison 2017). From this perspective, loneliness reflects not only individual vulnerability but also the timing and social organization of key demographic events.

A consistent observation across studies is that loneliness does not follow a linear pattern. Instead, it often rises in early adulthood and again in later life, forming a U-shaped curve across the life span (Nicolaisen and Thorsen 2014). These peaks correspond to periods of demographic significance. Young adulthood is marked by rapid transitions: completing education, leaving home, forming partnerships, and entering the labor market. These steps often require rebuilding social networks and adjusting to new identities. When support is limited, loneliness can intensify during this phase of exploration and

uncertainty (Goosby et al. 2013). Later in life, a different set of transitions emerges. Widowhood, retirement, declining health, and the loss of peers reshape daily routines and reduce relational anchors (Gerst-Emerson and Jayawardhana 2015; Smale, Wilson, and Akubueze 2022; Steptoe et al. 2013). These changes reflect demographic processes that accumulate over decades.

Gender adds further complexity. Women tend to report higher levels of loneliness, partly due to longer life expectancy, caregiving roles, and the burden of maintaining kin and household ties (Barreto et al. 2021; Pagan 2020). Men often experience a different form of vulnerability. Smaller friendship networks, fewer emotionally expressive ties, and strong norms of self-reliance can heighten loneliness after retirement or partnership loss (Segel-Karpas, Ayalon, and Lachman 2018). Cultural expectations also influence disclosure. In many settings, masculine ideals discourage men from acknowledging emotional need, producing what some scholars describe as hidden or unreported loneliness (Creighton and Oliffe 2010; Farrimond 2012; Kindlon and Thompson 2009). Cross-national analyses reveal that these gender gaps vary widely across societies, shaped by norms of intimacy, family obligation, and gendered expectations of care (Barreto et al. 2021).

The life course approach also introduces the concept of cumulative (dis)advantage (Melo, Guedes, and Mendes 2019). Emotional and social resources available at any life stage are conditioned by earlier experiences and structural position (Alegría et al. 2018). For example, children who grow up with limited access to stable attachment figures or social capital may face a greater risk of relational vulnerability later in life (Frosch, Schoppe-Sullivan, and O'Banion 2021). Likewise, repeated disruptions, such as frequent relocations, precarious employment, or unstable family structures, can erode the relational buffers that protect against loneliness (Irvine and Rose 2024). Over time, these trajectories widen inequalities in relational well-being across cohorts.

These individual-level processes unfold within shifting demographic regimes. The First Demographic Transition is marked by declining mortality and fertility, lengthened life expectancy, and reduced family size, increasing the likelihood of aging without co-resident kin (Dyson 2010; Kirk 1996; Lee 2003). The Second Demographic Transition, characterized by delayed union formation, increased cohabitation, childlessness, and the diversification of household forms, has further altered the relational scaffolding of social life (Lesthaeghe 2010). These shifts reflect greater autonomy and individual choice but also introduce new forms of relational instability (Lesthaeghe 2020). As Raz-Yurovich (2025) notes, smaller family networks can intensify loneliness across cohorts, even as changing values may normalize autonomy and reduce stigma. How individuals and cohorts adapt to these new social arrangements determines whether demographic change alleviates or deepens loneliness.

Demographic metabolism offers an additional bridge between individual trajectories and population change (Lutz 2013; Lutz and Muttarak 2017; Newmyer et al. 2022). It posits that aggregate social patterns evolve as new cohorts with distinct values and behaviors replace older ones.[3] Applying this framework to loneliness shows how shifts in age and sex composition alone can shape national profiles of connection and disconnection. Newmyer et al. (2022) demonstrate that aging populations may experience rising levels of loneliness even when age-specific rates remain constant. In this sense, loneliness reflects both individual experience and the demographic renewal that structures population life.

Together, these theoretical perspectives illustrate that loneliness is patterned by the timing of transitions, cumulative histories, and structural change. It emerges at the intersection of biography and demography, where personal trajectories meet shifting family systems, gender norms, and population structures. Seeing loneliness through a life course lens clarifies why it appears in predictable moments, affects some groups more than others, and reflects broader demographic transformations that extend far beyond the individual.

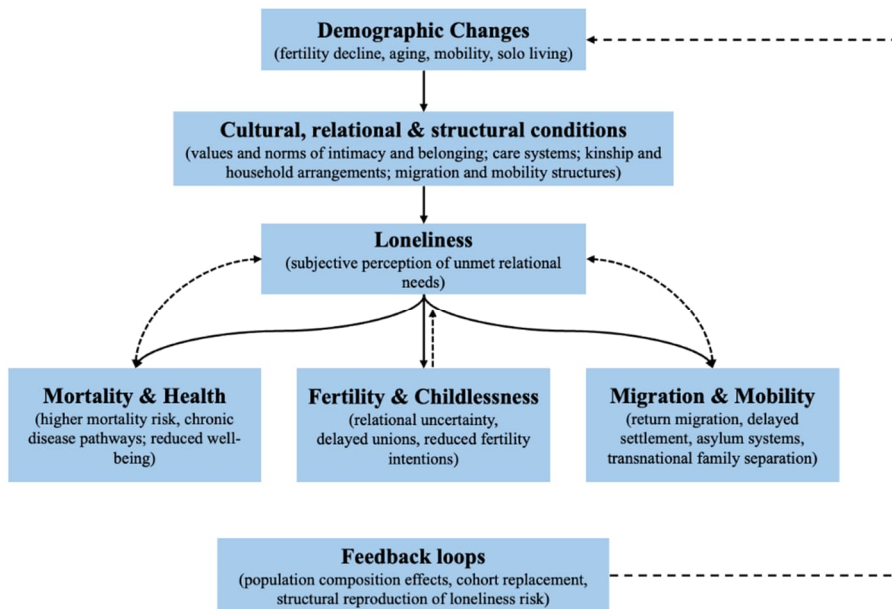# 3. The demography of loneliness: An analytical framework

This section presents the central analytical contribution of the essay: a demographic framework for understanding loneliness not merely as a by-product of social change, but as a population process in its own right. The term 'demography of loneliness' therefore describes how loneliness is distributed across populations, how it changes over time, and how it interacts with the core domains of fertility, mortality, and migration.

At its core, this perspective connects individual emotional experience to demographic structures. Loneliness is patterned by attributes such as age, sex, marital status, household composition, and migration background. These patterns do not arise randomly. They emerge from the same forces that shape demographic behavior: the timing of partnership formation, the availability of kin, the stability of households, and the institutions that distribute care and social support. By linking loneliness to these determinants, demographic analysis helps reveal not only who is most vulnerable but also when vulnerability peaks and which social arrangements intensify or alleviate it.

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[3] Applying demographic metabolism to loneliness, however, requires conceptual care. The framework assumes compositional change, not direct transmission of traits across cohorts. Because loneliness is shaped by subjective perception and can respond abruptly to period shocks such as pandemics, migration crises, or recessions, it should not be treated deterministically. It serves best as a heuristic bridge linking micro-level life-course processes with macro-level demographic renewal, allowing scholars to estimate how far social change must go to offset demographically implied trends.

To conceptualize these interactions, Figure 1 presents a demographic framework for analyzing loneliness, structured around four interrelated domains: (1) fertility and childlessness, (2) mortality and health, and (3) migration and mobility. Each of these domains reflects both upstream structural determinants of loneliness (for example, declining fertility, population aging, residential segregation, and migratory displacement) and downstream demographic consequences that loneliness may produce or reinforce (such as altered health trajectories, delayed fertility, and return migration). While these processes differ across life stages and populations, they are bound together by common mechanisms: changing family systems, shifting social norms, and unequal access to relational and institutional support.

Figure 1:   The demography of loneliness: A conceptual framework

Note: This figure summarizes how demographic processes (fertility decline, aging, migration) generate structural conditions that foster loneliness, which in turn influences demographic behaviors and outcomes such as mortality risk, fertility intentions, care needs, migration, and mobility.

The subsections that follow examine each of these domains in turn, drawing on existing research and theoretical insights to outline how loneliness intersects with fundamental components of population change.

3.1 Mortality and health

Loneliness is strongly associated with poorer health outcomes and higher mortality risk (Holt-Lunstad 2021; Holt-Lunstad et al. 2015). Large longitudinal studies show that individuals who feel persistently lonely face a significantly greater likelihood of early death, even after accounting for age, health status, and socioeconomic conditions (Chan et al. 2015; Steptoe et al. 2013). Meta-analyses involving more than 3 million participants confirm these patterns and indicate that the magnitude of this risk is comparable to well-established health factors such as obesity, smoking, and physical inactivity (Holt-Lunstad et al. 2015; Holt-Lunstad, Robles, and Sbarra 2017; Leigh-Hunt et al. 2017).

Biological and psychosocial research helps explain why loneliness consistently 'gets under the skin' (Freilich 2023; Shiovitz-Ezra and Parag 2019). Chronic feelings of disconnection activate stress responses that disrupt inflammatory and neuroendocrine systems, weaken immune function, and accelerate physiological wear and tear (Finley and Schaefer 2022; Freilich 2023; Shiovitz-Ezra and Parag 2019). Over time, these biological imprints increase vulnerability to cardiovascular disease, cognitive decline, frailty, and metabolic dysregulation (Cacioppo and Cacioppo 2014; Hawkley and Cacioppo 2010). Loneliness also shapes behavior. It is associated with sleep disturbance, reduced physical activity, poor diet, and higher rates of depression and anxiety (Owczarek et al. 2022), which in turn compound existing health risks.

Yet the relationship between loneliness and mortality cannot be understood through biology alone. It is also deeply social and biographical. As people age, losses accumulate. Widowhood remains a strong predictor of loneliness in later life (Lee et al. 2001). The death of a spouse reshapes daily routines, weakens emotional anchoring, and increases the burden of managing health and care alone. Retirement can create another kind of rupture. Workplaces often provide structure, companionship, and recognition – social ingredients that disappear abruptly at retirement, leaving many older adults reliant on shrinking networks (Kuhn 2018; Segel-Karpas, Ayalon, and Lachman 2018).

At the same time, social connection serves as a powerful protective factor. Individuals with comparable health conditions live longer when they have trusted, emotionally supportive ties (Umberson, Crosnoe, and Reczek 2010; Umberson and Karas Montez 2010). Social connection helps people navigate treatment, adhere to medication, and maintain routines that support health (Holt-Lunstad 2021). By contrast, loneliness can exacerbate the burden of chronic illness and speed the transition into institutional care when support from family or friends is limited (Hawkley et al. 2008; Steptoe et al. 2013; Wang et al. 2018).

Together, these mechanisms show that loneliness is both a marker and a driver of unequal survival. It contributes to excess mortality among groups already disadvantaged by gender, class, race, disability, or living arrangement. As populations age and more

people live and die alone, loneliness becomes a structural condition that shapes who survives, who thrives, and who becomes vulnerable to early death.

3.2 Fertility and childlessness

Fertility behavior is shaped not only by economic resources and normative expectations but also by emotional orientation toward relationships, support, and future security (Bazzani and Vignoli 2022). In this context, loneliness (both experienced and anticipated) can influence fertility decisions in complex and sometimes contradictory ways. Demographers have long recognized that childbearing decisions reflect more than the desire for reproduction: they are bound up with questions of meaning, legacy, intimacy, and the social architecture of care (Balbo, Billari, and Mills 2013; Bernardi and Klärner 2014; Frejka 2017; Mason 1997). When relational life is fragile or uncertain, the desire for children may either intensify (as an attempt to secure connection) or be delayed (as uncertainty reduces the perceived feasibility of parenting).

Recent empirical work adds nuance to this relational dimension. For instance, in Finland young adults aged 26–30 who report not feeling lonely exhibit higher childbearing intentions, suggesting that absence of loneliness (indicative of relational and network support) is positively associated with fertility intentions (Artamonova et al. 2024). Similarly, a study of Swedish and Norwegian women finds that both loneliness and depression are negatively associated with the realization of fertility intentions (Carlsson and Kim 2024).

At the same time, chronic loneliness is often associated with reduced fertility intentions, particularly when it overlaps with depressive symptoms, low self-efficacy, or socioeconomic precarity (Carlsson and Kim 2024). Individuals who feel socially disconnected may perceive greater barriers to childrearing, whether due to the absence of a partner, diminished family support, or broader uncertainty about the future (Al-Mutawtah et al. 2023). Moreover, loneliness can constrain access to partnership markets, delay union formation, or disrupt relational stability, thereby affecting both the timing and likelihood of having children (Bryan et al. 2024; Vučenović, Petrović, and Jelić 2024).

Loneliness may also interact with fertility through the experience (and consequences) of childlessness (Kailaheimo-Lönnqvist et al. 2024). As fertility rates have declined and the share of individuals reaching older age without children has increased, the relationship between childlessness and later-life loneliness has received growing attention (Penning, Wu, and Hou 2024). While not all childless individuals are lonely, research shows that childlessness, especially when involuntary, can increase the risk of

social isolation, particularly in societies where family remains the primary source of informal care and social integration (Penning, Wu, and Hou 2024; Vikström et al. 2011).

From a demographic perspective, these dynamics point to a feedback loop: lack of social connections may reduce the likelihood or timing of childbearing, and reduced fertility and greater childlessness may in turn increase the risk of loneliness later in life. As populations age and family sizes shrink, this loop may grow more salient. However, loneliness should not be portrayed as a sole driver of fertility outcomes. Its effect is mediated by partnership formation, social support, norms, and institutional context, and is likely strongest in life stages when reproductive decisions, unions, and social networks are actively being formed. In such contexts, the weakening of traditional family scripts, combined with the rise of individualized life trajectories, produces new relational configurations, some empowering, others marked by disconnection.

3.3 Migration and displacement

Migration reshapes social relationships in profound and often ambivalent ways. It can expand opportunities for connection and mobility, yet it can also rupture long-standing ties, separate families, and expose individuals to unfamiliar social and cultural environments (Martin 2018; Shrestha et al. 2024). These disruptions make loneliness both a potential driver and a consequence of migration, shaped by who migrates, why they move, and how they are received or incorporated into new places.

For some individuals (particularly young adults) loneliness may function as a push factor (Delaruelle 2023). Feelings of stagnation, marginalization, or lack of belonging can motivate aspirations to seek new environments, new identities, or new forms of relational possibility (Sieng and Szabó 2023). Migration is often described in economic terms, but it also carries emotional meanings related to reinvention, autonomy, and escape from social constraints (Czaika, Bijak, and Prike 2021). In these cases, mobility becomes a strategy to reshape relational life.

At the same time, migration frequently produces loneliness in the short and medium terms. Leaving behind family, friends, and familiar routines creates abrupt social dislocation. International migrants, in particular, may face language barriers, discrimination, and legal precarity that make building new ties difficult (Crawford et al. 2023; Suphanchaimat et al. 2015). The risk of loneliness is higher among those who migrate alone, those in low-skilled or unstable jobs, and those whose cultural backgrounds diverge sharply from the host society (Delaruelle 2023; Martin 2018). Even when new networks are formed, the absence of established ties often leaves relational gaps that persist across years.

Loneliness is also redistributed across borders and generations. Migration does not simply relocate disconnection: it can create 'transnational loneliness' (Bilecen, Diekmann, and Faist 2025; Sampaio and Carvalho 2022). Parents left behind by adult children, spouses navigating long-distance marriages, and children in transnational households all face emotional disruption that erodes everyday intimacy (Sampaio and Carvalho 2022). Digital communication can soften but not eliminate these gaps. Remittances sustain livelihoods but cannot compensate for lost co-presence (Chalá Mejía, Suquillo Guijarro, and Villafuerte 2022). As a result, loneliness can travel along migratory corridors, linking the emotional well-being of migrants and non-migrants in complex ways.

Refugees and forcibly displaced populations represent a particularly vulnerable group. Displacement often involves the abrupt loss of home, community, and cultural identity, followed by prolonged periods of uncertainty, institutional dependency, and restricted mobility (Rüdel and Joly 2024). Loneliness in these settings is not only personal but structural, produced by detention regimes, asylum processes, and the isolation of refugee camps (Nguyen et al. 2024). While community resilience can emerge in such contexts, the erosion of familial and communal anchors often leaves long-lasting emotional effects (Nguyen et al. 2024; Rüdel and Joly 2024). For these populations, loneliness becomes entangled with trauma, loss, and social exclusion.

From a demographic perspective, migration-related loneliness has implications that extend well beyond individual well-being. Loneliness may influence migrants' decisions to return home, relocate internally, or remain in host societies (Jang and Tang 2022). Moreover, in aging societies with high rates of out-migration or immigration, loneliness can accumulate among both older adults left behind and older migrants navigating unfamiliar institutional settings with limited relational infrastructure.

Table 1 summarizes the main findings from this section, outlining the bidirectional relationships between loneliness and key demographic domains.

Table 1:   Demographic domains and their relationship to loneliness

Domain	How demographic change shapes loneliness	How loneliness influences demographic outcomes
Mortality and health	Population aging increases widowhood, chronic illness, and solo living; early adulthood brings relational instability and mental health strain.	Raises risk of premature mortality; worsens chronic disease pathways; reduces well-being, recovery, and engagement with preventive care.
Fertility and childlessness	Smaller families, delayed union formation, and low fertility reduce the availability of kin and support networks across the life course.	Lowers fertility intentions, delays partnership formation, and contributes to unmet fertility desires; shapes pathways into voluntary or involuntary childlessness.
Migration and displacement	Disrupts social networks; cultural distance, discrimination, and precarious legal contexts heighten relational vulnerability.	Shapes settlement, return migration, and integration; affects partnership stability and family life.

Note: This table is interpretative and synthesizes findings presented in Section 3.

4. Concluding remarks

4.1 Summary

This essay has argued that loneliness is not merely a private emotion, but a relational condition shaped by demographic change. Patterns of aging, partnership, fertility, migration, and household structure influence who becomes lonely, when, and under what circumstances. At the same time, loneliness influences demographic behavior and outcomes, including fertility intentions, mortality risk, mobility decisions, and the demand for care. By situating loneliness within these population processes, this essay proposes a demographic perspective that treats relational well-being as part of the infrastructure through which people live, age, and form families. Incorporating loneliness into demographic thinking strengthens the field's ability to describe vulnerability, anticipate social needs, and understand how connection or disconnection is produced across the life course.

4.2 Should loneliness be a demographic indicator?

Whether loneliness should be considered a demographic indicator depends on whether indicators are meant to capture not only observable events, but also patterned states that shape population functioning. Although loneliness is subjective, it can be incorporated into demographic models much like disability status, health expectancy, or subjective well-being – characteristics that demographers routinely measure and project.

Recent studies illustrate this potential. Raymo and Wang (2022) used Sullivan's method to estimate lonely life expectancy in the United States, revealing pronounced inequalities across social groups. Newmyer et al. (2022) applied age- and sex-specific loneliness rates to United Nations projections to estimate how demographic aging will reshape global loneliness profiles. These examples show that established demographic methods, including life tables, cohort-component projections, microsimulation models, and demographic metabolism approaches, can meaningfully accommodate loneliness.

Major population surveys offer a practical pathway for doing this. Brief and validated instruments, such as the UCLA scale and its culturally adapted versions like the UCLA-BR, can be integrated into longitudinal and cross-national surveys with minimal burden. Including loneliness measures in HRS, SHARE, ELSA, GGS, DHS, and national health surveys would allow researchers to examine relational vulnerability across cohorts and transitions, and to link loneliness to established demographic outcomes.

4.3 Challenges and limitations

Treating loneliness as a demographic phenomenon presents conceptual, methodological, and empirical challenges. Unlike fertility, mortality, or migration, loneliness leaves no administrative trace as yet. It cannot be observed in vital statistics, census forms, or population registers, and must instead be inferred from social surveys. This reliance on self-reported data makes it different from core demographic indicators. It also constrains the temporal and spatial comparability of evidence: we still lack long-term series to evaluate whether loneliness has increased or declined, even in data-rich contexts such as the United States or Europe.

Loneliness is also culturally embedded. Norms of emotional expression, stigma, and social expectations shape how people understand and report it. Even validated instruments require careful linguistic and cultural adaptation, as demonstrated by international applications of the UCLA scale and its derivatives. These challenges are not unique to loneliness: indicators such as self-rated health or life satisfaction face similar constraints. The key question is not whether loneliness can be measured with precision, but whether it is too consequential to ignore.

Data coverage is uneven. Most harmonized estimates come from high-income countries, while low- and middle-income regions remain underrepresented (Surkalim et al. 2022). Even within well-studied regions, longitudinal data remain scarce, limiting our ability to trace how loneliness unfolds across the life course or to disentangle age, period, and cohort effects. Cross-sectional studies offer valuable snapshots but cannot establish causality or capture the dynamics of social disconnection over time.

Methodologically, incorporating loneliness into demographic frameworks will require modest but deliberate innovation. National surveys, including culturally adapted versions such as the UCLA-BR in Brazil, can incorporate brief validated scales into household or health modules. International initiatives are emerging. The European Commission now recommends loneliness indicators across EU states, and the UK Office for National Statistics includes them among its national well-being metrics. Similar efforts are underway in Japan, Canada, and parts of Latin America, demonstrating that population-level monitoring of loneliness is both feasible and policy-relevant.

4.4 Toward a demography of belonging

Looking ahead, integrating loneliness into demographic work opens the door to a broader agenda: a demography of belonging. Such an agenda would ask not only how populations grow or decline, but also how people remain connected, supported, and recognized within changing social and institutional environments. It would encourage collaboration across

disciplines, the development of new indicators, and the design of pilot studies that test loneliness modules in large surveys or incorporate relational states into life table and microsimulation models. It would also invite exploration of new data sources, from community-level data to digital traces, while remaining attentive to ethical and representational concerns.

A demography of belonging would place everyday connection at the center of population analysis. Instead of focusing solely on who is born, who dies, or who moves, it would examine how individuals become embedded in social networks or, conversely, how they experience exclusion. This perspective emphasizes that belonging is not simply a personal feeling but a product of demographic, spatial, and institutional contexts. Changing partnership patterns, widespread solo living, aging without kin, long-distance migration, and unequal access to community or digital infrastructures all contribute to how people experience connection or disconnection across the life course.

Traditional social surveys will remain indispensable for measuring loneliness and belonging, yet their limitations invite methodological innovation. Novel data sources could complement survey evidence. Digital traces from Google Trends, sentiment analysis of social media, communication metadata, or mobility patterns inferred from smartphone-based data may help identify shifts in social interaction, emotional tone, or public discourse around isolation and connection. When combined with demographic data, these sources could provide early-warning signals of social fragmentation or identify emerging generational differences in relational life. Still, such approaches require ethical safeguards and critical interpretation. Online visibility does not necessarily equate to social integration, and digital data often exclude the very groups most vulnerable to loneliness: the poor, the elderly, and the digitally disconnected. A demography of belonging must therefore combine technological innovation with demographic sensitivity, linking new forms of evidence to established life course and population frameworks.

A demography of belonging does not abandon the field's core strengths. It builds on them, recognizing that population science must adapt to new realities. As families become more diverse, living alone more common, and support systems more fragmented, the ability to connect will shape not just individual lives, but population outcomes. A demography of belonging could reclaim one of demography's core purposes: not just to count populations but to understand how people live together – and what happens when they no longer do. Including loneliness in our frameworks is not a secondary goal; it is a necessity for a discipline committed to understanding and improving life in all its forms.

5. Data availability

This essay is based on the synthesis and analysis of publicly available secondary data sources, including published meta-analyses and international survey reports. No new data were generated. All data cited are accessible through publicly available repositories or academic publications referenced in the manuscript.

6. Generative Artificial Intelligence (AI) disclosure

In the final stage of preparing this manuscript, I used Claude AI to improve readability and enhance clarity in some sections of the text. The tool was employed strictly for language editing purposes. I affirm that I am solely responsible for the content, structure, and all intellectual contributions presented in this manuscript. No part of the scientific reasoning or interpretation was generated by the AI tool.

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