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PEER REVIEWED ARTICLE

Essential yet overlooked: faculty insights on integrating population dynamics into university curricula

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Abstract

Population dynamics play a pivotal role in development, exacerbating social, economic and environmental challenges. Yet, this factor remains largely understudied in undergraduate curricula in the United States. This study explores the perceptions of University of California (UC) faculty of the concept of population dynamics and its integration into their teaching. Through a mixed-methods approach, it investigates the meanings that faculty associate with this concept, the importance they attribute to it, and the barriers they face in teaching it. Findings reveal that UC faculty across multiple disciplines believe that understanding this topic is essential for college students' future careers. However, study participants reported that population dynamics were infrequently integrated into undergraduate courses due to their interdisciplinary

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nature, lack of faculty training in demography and lack of prioritisation by the UC system. Other barriers to teaching this topic include the sensitive nature of associated themes like migration, family planning and gender norms. Our findings suggest that the teaching of this subject, as well as its integration into the curriculum, lacks a systematic and coordinated approach. Its inclusion (or lack thereof) depends largely on individual faculty's preferences and their level of demographic expertise. The gap between its perceived importance and its representation in the curriculum highlights the need for universities to make a more consistent effort to support faculty in integrating this topic in meaningful ways. Adequate coverage of population dynamics within institutions of higher education will help students to increase awareness and contribute to efforts to address global demographic challenges.

Keywords: Population dynamics, demography, higher education, teaching demography, undergraduate curricula.

Introduction

Population dynamics play a pivotal role in development – exacerbating social, economic and environmental challenges. They are of particular importance for equity and social justice and have implications for topics ranging across development sectors, including food security, gender equity, climate change and public health. Despite the foundational and cross-sectoral nature of the topic, it appears to have received minimal attention in undergraduate curricula in the United States.

Population dynamics is the study of why population numbers change in time and space and how these processes operate through biological, social, and environmental processes (Turchin, 2003). In this paper, the term 'population dynamics' refers to four phenomena: population growth, population decline, migration and population age structure (the fraction of each age group within the total population). These trends are rapidly changing, with profound implications for the planet and the life that it sustains. We chose to use the term 'population dynamics' rather than 'demography' to emphasise the interdisciplinary processes and patterns of change in populations, which extend beyond the statistical analyses typically associated with demography.

While global population growth has slowed, United Nations projections estimate that the population will continue to grow from 8.2 billion in 2024, to an estimated 8.5 billion by 2030, 9.6 billion by 2050 and 10.2 billion by 2100 (United Nations Department of Economic and Social Affairs, 2024). Rapid population growth has a number of adverse implications for development (Speidel and O'Sullivan, 2023; Wilmoth et al., 2022). Environmental and climate scientists draw attention to the adverse impact of overconsumption and continuous economic growth in high-income countries in light of the current environmental crisis. They also recognise the need for population stabilisation, followed by a gradual decrease in the human population by advancing gender equity and voluntary family planning and by supporting gender equity in education (Ripple et al., 2022, 2023).

Population dynamics is often recognised as a neglected field of inquiry. For example, until recently, climate change science has either ignored population dynamics or treated these issues in a fragmentary or simplified manner (O'Neill et al., 2010). In relation to teaching of population dynamics at the university level, we found a lack of studies discussing the integration of demographic concepts into university curricula in the United States.

The field of demography focuses on temporal and spatial changes in population numbers and composition, such as population growth, decline, migration and age structure. It is a specialised field that is not usually offered to undergraduate students, with the assumption that graduate school is a more appropriate time for students to specialise in this technical field (Tabutin and Depledge, 2007). Using statistics, demographers systematically analyse trends in the human population, including births, deaths, fertility, migration and age structure. They also study the ways in which these trends influence environmental, economic and social sectors.

Very few studies have assessed levels of demographic knowledge among university students. McFarlane and Hansen (2023) documented the level of demographic knowledge among undergraduate students in political science at the University of New Mexico over the past decade (2013–2022), and found that this group was largely ignorant about basic demographic facts. Although their sample size was only 271 students, the findings still provide valuable insights into the state of demographic knowledge among American university students. To the authors' knowledge, no studies to date have assessed the degree to

which population issues (population dynamics and the policies affecting them) are incorporated into courses across various disciplines (from public health to economics to environmental studies) or explored the difficulties and obstacles faced by faculty members.

This study contributes to the knowledge base around how population dynamics, as a field of inquiry, is integrated into university coursework. Utilising a mixed-methods approach, it explores the meanings faculty associate with the concept of population dynamics and the barriers they encounter in teaching it. It examines the perceived importance of population dynamics among a diverse group of faculty members who teach undergraduates and graduate students at one of the world's most prestigious institutions of higher education and research – the University of California (UC) system. The intention of the study is exploratory in nature. We were not aiming for the study to capture a representative sample of faculty members, nor were we aiming to quantify the percentage of faculty members who currently include the topic of population dynamics in their courses.

Nine of the ten UC campuses provide both undergraduate and graduate education: Berkeley, Davis, Irvine, Los Angeles, Merced, Riverside, San Diego, Santa Barbara and Santa Cruz. The tenth campus, based in San Francisco, exclusively serves graduate students in health-related fields. The UC system is one of the largest systems of undergraduate education in the US, training nearly 300,000 students annually. Alumni of the UC system tend to occupy influential positions in academia and industry, across a broad range of fields such as technology, healthcare, public policy and science. The UC system hosts specialised population research centres at UC Berkeley, UC Los Angeles and UC Santa Barbara. Despite this, none of the UC campuses have undergraduate majors dedicated to demography or population studies, although some campuses have minors, summer programmes or seminars related to this topic that are open to undergraduates.

Methods

The study team adopted a mixed methods approach incorporating an online survey and in-depth interviews. The survey provided insight on faculty members' understanding of the term 'population dynamics', their perceptions of its importance in their fields, the challenges of teaching it and the related topics they include in their courses. The interviews enabled a deeper exploration

of participants' perspectives, highlighting the diverse views and meanings associated with population dynamics, and reflecting its multifaceted nature, at the individual and disciplinary level.

Participant selection

The participant selection process started by identifying eight broad academic disciplines, based on three factors: a) the presence of corresponding departments on at least five UC campuses; b) the likelihood that the topic of population dynamics would arise within coursework in that discipline and; c) the relevance of population dynamics for each disciplinary field. The eight selected fields included: biology, economics, environmental sciences, public health/global health, women's/gender/sexuality studies, global studies, political science/public policy and geography/urban planning. Four disciplines that met the above criteria (anthropology, psychology, philosophy and sociology) were excluded in order to maintain a manageable focus.

UC faculty members were eligible for this study if they were based at one of the ten UC campuses and had taught a course at either the graduate or undergraduate level in one of the eight selected fields of study between the fall of 2021 and spring of 2023 (i.e. the 2021–22 and 2022–23 academic years). Potential participants were sourced through UC webpages, as well as by contacting department administrators in the selected fields. All levels of faculty were included, including full, assistant, adjunct or associate professors and lecturers. Over 2,000 invitations to participate in the study were sent via email. Additionally, participants were invited to share the link to the survey with UC colleagues. Eventually, study participants included faculty from beyond the eight disciplinary fields, such as sociology, because of the prevalence of faculty with multiple affiliations and/or appointments across disciplines, and the possibility of recruitment via participants sharing the survey link.

Online survey

The team conducted a confidential online survey in Qualtrics from 17 April to 20 June, 2023. The survey was designed to take ten to twelve minutes to complete, and consisted of both close-ended questions and open-ended questions (see Appendix A). Questions were organised into four parts: (1) academic background (affiliation, disciplinary focus, types of courses taught); (2) interactions with

students surrounding the topic of human population dynamics; (3) experiences related to teaching about policies or programs related to population dynamics; and (4) demographic questions. We asked faculty how they had incorporated population dynamics into courses taught in 2021–22 or 2022–23, assessing the frequency and depth of their engagement, comfort level in teaching the topic, challenges faced and perspectives on the topic. The survey also invited them to share their perspective on public debates related to population dynamics, like environmental sustainability and reproductive autonomy, and their thoughts on how policy and/or programmes might influence these debates. With the exception of a question about UC campus affiliation, all questions were optional (non-mandatory) and several questions provided the option for respondents to input text (e.g. as an 'other' field).

In-depth interview

All survey respondents who indicated that they include the topic of human population dynamics in at least one of their courses were invited to participate in a twenty-minute follow up interview. The aim of the interview was to gain a deeper understanding about the participant's decision to integrate this topic into their courses. We wanted to learn about how this was being done, and about how the students had responded.

Interviews were conducted by phone or Zoom in July–September 2023 by one of the researchers (CD, MM or PP). Reasonable efforts were made to schedule interviews with all participants who indicated interest in participating, however, some interviews did not occur due to scheduling conflicts and non-responses to follow-up emails. These interviews were recorded and transcribed with participants' consent, to understand their motivations and methods in detail. These semi-structured interviews, featuring six open-ended questions and probes, allowed participants to guide the conversation, to explain how and why they integrated population dynamics into their courses, and to share their observations on student responses to the topic (Appendix B).

Analysis

The results from the survey and the interviews were initially analysed separately. After cleaning the survey data to remove incomplete records of participants who did not respond to any survey questions beyond Part 1 on respondent background

(n=25), there were 125 survey respondent records. We used descriptive statistics to compile the survey results and assessed themes that emerged in the free-form answers to the open questions. The in-depth interview transcripts were analysed through thematic analysis.

We used Excel software to manage and analyse the open-ended responses from the survey and in the interviews. We present both the survey and interview results together below, as the findings from the interviews strongly supported those of the survey. Results were rounded to the nearest integer to enhance readability (for this reason, percentages may not add up exactly to 100 per cent).

To ensure interpretative rigour, several techniques were employed including triangulation (combining multiple methods, sources and theories to enhance the validity of the results), reflexivity (awareness of the researcher's own perspectives), and bracketing (making an effort to refrain from imposing the researchers' perspectives on the findings throughout the research process). Ethical clearance for the study was received from UC Berkeley and University of Ottawa.

Results

Study participants

A total of 125 faculty participated in the online survey, including individuals across all nine UC campuses. The three primary disciplinary affiliations of respondents were public health (n=45/125, 36%), biology (n=25/125, 20%), and environmental studies (n=19/125, 15%). Additional participant characteristics are shown in Table 1.

Table 1. Overview of participant characteristics (online survey)

Primary disciplinary affiliation	n	%
Public Health	45	36
Biology	25	20
Environmental Studies	19	15
Economics	14	11
Gender/Women's/Sexuality studies	5	4

Political Science/Public Policy	5	4
Geography/Urban Planning	5	4
Global Studies	1	1
Other[a]	6	5
Total	**125**	
Age		
Under 35	3	2
36–50	45	36
51–65	42	34
Over 65	11	9
Prefer not to answer / no response	24	19
Total	**125**	
Gender		
Woman	54	43
Man	45	36
Non-binary/gender queer	4	3
Prefer not to answer / no response	22	18
Total	125	
Participant identified as a person of colour?		
No	72	58
Yes	22	18
Preferred identification[b]	5	4
Prefer not to answer / no response	26	21
Total	**125**	

[a] Other responses included: anthropology, environmental and occupational health, history and sociology

[b] The five respondents with a preferred identification listed: Asian American, cultural mestiza, Latina, Latine and Whadjuk.

Out of the 52 survey respondents who were eligible to be invited for a follow-up interview (that is, indicated that they do teach on the topic of population dynamics), half (n=26) indicated that they would be willing to participate in an interview. In total, we conducted follow-up interviews with eleven participants. Interview participants were affiliated with the following disciplines: public health (n=3), biology/public health (n=2), environmental studies or environmental sciences (n=2), biology (n=1), economics (n=1), public policy (n=1) and sociology (n=1). To maintain anonymity, the characteristics of this small group of participants are not described in further detail.

Inclusion in courses

A majority of survey respondents (75/125 respondents, 60%) discussed, or planned to discuss in the forthcoming semesters (up until spring 2022–23), the topic of human population dynamics in their courses.[6] Among the 75 respondents who indicated that they integrated population dynamics in their teaching, we asked them about the extent to which they did so. The majority of these survey respondents (41/75, 55%) answered 'moderately', defined as mentioning it in multiple sessions throughout the course. Just under a third of respondents (21/75, 28%) answered 'minimally', mentioning it in only one session per course. Only 11 respondents out of 75 (15%) answered 'substantially', defined as the inclusion of the topic of human population dynamics within their course objectives (two respondents (3%) did not provide a response). Forty-five survey respondents (n=45/125, 36%) indicated that they did not discuss human population dynamics in their courses. The top reasons why they omitted the topic (noting that multiple responses were possible) included: lack of direct relevance to course material (n=35/45, 78%) and topic being outside of area or expertise (n=17/45, 38%) (Table 2).

Table 2. Reasons given for not discussing population dynamics in their courses (online survey)

	n	%
This topic is not directly relevant to my course material	35	78
This topic is outside of my area of expertise	17	38

6 This was a 'yes' response to a yes/no question (n=45/125, 36% responded 'no' and 5/125, 4% did not respond).

I do not wish to integrate this topic into my course material	7	16
I do not have a connection with a qualified faculty member who could guest lecture on this topic	3	7
Other[a]	6	13

Note: multiple responses were possible. Percentages calculated based on the total number of respondents (n=45) who indicated that they did not discuss human population dynamics in their courses.
[a] Other responses included: other topics have higher priority; have never considered teaching about it; campus climate not favourable to the topic

Participants in the semi-structured interviews expressed that population dynamics is a pertinent subject for inclusion in their courses and emphasised its pivotal role in enabling students to acquire a comprehensive understanding of their primary subject matter. 'We don't talk about population and changes in population enough', stated interview participant #9 from Environmental Sciences. Participants acknowledged key linkages between population and environment, population and social justice, and population and reproductive health and rights. Many participants pointed to the interconnectedness and indissociable nature of these themes.

> It's kind of a constant theme. In our Environmental Science class, even though we're covering other topics, we know that deforestation, climate change, and industrialized agriculture – all of these things are related to population growth. So that thread plays throughout the entire class as we're talking about different environmental issues. (Interview participant #7, Environmental Studies)

A recurring theme in the interviews was that population dynamics was a neglected field both at the undergraduate and graduate levels. Many faculty viewed population dynamics both as a strategic set of skills needed for the future careers of their students, and as a way to foster understanding of the interconnected nature of different sectors.

> Our students will need tools to track the way the population and culture shift over time – and how technology plays a role, opening up opportunities to prevent death from communicable or non-communicable diseases … Not learning about population dynamics is

> not going to hurt them on the job market, but it hurts them intellectually. (Interview participant #11, Public Health).

This point was reinforced by other interview participants, who also recognised the importance of learning about the topic.

> I would still love to teach more classes on population and demography. For our undergrads, I think that there's just a lot of applications for it. There's a lot of demand for those kinds of skills … having population analysis tools in your toolbox could be really helpful. (Interview participant #1, Sociology)

> The grad students are the ones who are going to be experts in their areas. I think it is a shame for them to not get this understanding of the interdisciplinary interactions with population dynamics, you know? (Interview participant #8, Biology)

Relevance to societal goals

Respondents to the online survey were asked to assign a score to the importance of teaching population dynamics for various societal goals. Between sixty and eighty per cent of respondents considered population dynamics to be of 'critical' or 'above average' importance to these goals (Table 3).

Table 3. Perceived importance of population dynamics for key selected societal goals (online survey)

	Critical importance	Above average importance	Average importance	Below average importance	Not important	Non-response	Total
Ecosystem preservation/restoration							
n	48	37	19	4	2	15	125
%	38	30	15	3	2	12	
Climate resilience							
n	44	40	16	8	1	16	125
%	35	32	13	6	1	13	

Protection of endangered species							
n	39	38	16	12	4	16	125
%	31	30	13	10	3	13	
Gender equity							
n	29	40	28	8	2	18	125
%	23	32	22	6	2	14	
Poverty alleviation							
n	51	38	13	4	1	18	125
%	41	30	10	3	1	14	
Healthcare access							
n	45	39	18	5	1	17	125
%	36	31	14	4	1	14	
Economic development							
n	42	37	25	4	0	17	125
%	34	30	20	3	0	14	

In the follow-up interviews, many participants' perspectives were shaped by whether they viewed population growth or decline as an opportunity, or as a matter for concern. For example, some participants focused on the negative impact of population growth, highlighting its role in worsening environmental and social challenges.

Many interviewees, especially those from environmental and health-related fields, associated population dynamics with the earth's carrying capacity and finite resources and viewed population growth as a matter of growing concern. However, one faculty member held an opposing view, that population growth is a potential driver of innovation and growth.

> Population growth potentially explains why living standards have continued to increase, because more people mean more ideas created. Ideas are basically what creates long term growth in the modern economy. (Interview participant #3, Economics)

Despite the widespread concern among the interview participants about the impact of population growth, population decline was also mentioned as a cause for concern by faculty focused on health economics and public health.

> In countries with low birthrates like Japan ... the children will have to travel from further provinces to get enough kids to have a class. If you want kids to have cohorts, you have to get them together. Or you do what the United States is going to do – send everybody to sit in front of a computer so that we can have cohorts, but this means that addressing children's health needs is going to be harder. If we're not seeing them physically, we're not going to be able to get nutrition to them the way they are getting it now – by offering them school breakfasts and lunches. There's all sorts of implications of the shift in population age structure that we're going to have to deal with in the future. (Interview participant #4, Public Health).

The participant elaborated further on how population dynamics impact health care costs:

> In my field, we really have to think about the financing of long-term care and the aging of the health care workforce, because even the people caring for other people, nurses and physicians, are getting older. (Interview participant #4, Public Health)

Importance for student learning

All survey respondents were asked if human population growth and decline, age structure and migration were topics that they considered important for their students to understand. The large majority (n=103/125, 83%) answered yes, while nine respondents (n=9/125, 7%) answered no. Twelve respondents (n=12/125, 10%) were unsure and one did not provide a response (n=1/125, 1%). Among four defined subtopics of population dynamics, survey respondents tended to rank the importance of population growth and migration higher than age structure and population decline (Table 4).

Table 4. Faculty views on the perceived importance for students to understand key subtopics of population dynamics (online survey)

	Very important	Important	Somewhat Important	Not important	Not sure / non response	Total
Human population growth						
n	49	35	17	1	23	125
%	39	28	14	1	18	
Human migration						
n	43	38	17	3	24	125
%	34	30	14	2	19	
Human population age structure						
n	37	29	19	14	26	125
%	30	23	15	11	21	
Human population decline						
n	23	28	32	12	30	125
%	18	22	26	10	24	

In the interviews, we asked participants to identify the specific subtopics they linked to population dynamics in their courses. Table 5 provides an overview of the eleven individual responses, alongside their affiliated discipline(s).

Table 5. Topics linked to population dynamics by interview participants

	Interviewee self-identified discipline	Topics associated with population dynamics
1	Sociology	Population composition and change; social justice; migration; diversity
2	Biology/Public Health	Environmental sustainability, migration, social justice
3	Economics	Economic opportunities and per capita analyses, migration, immigration
4	Public Health	Population decline and ageing, elder care, health systems, migration and immigration

5	Public Health	Health, environmental sustainability
6	Biology	Environmental sustainability, carrying capacity, family planning, abortion
7	Environmental Studies	Environmental sustainability, carrying capacity, nutrition, gender norms, cultural aspects of fertility, reproductive autonomy, abortion
8	Biology/Public Health	Environmental sustainability, social justice, population composition and change, long term perspectives, physical and biological geography
9	Environmental Sciences	Environmental sustainability, carrying capacity, environmental footprint, ethics, reproductive rights
10	Public Policy	Population composition and change, migration, family structure, social justice, environmental sustainability
11	Public Health	Population composition and change, epidemiological and demographic transition, health equity, aging, nutrition, gender norms, family planning, abortion

Factors influencing population dynamics

Overall, 52 survey respondents indicated that they teach about human population dynamics. Just under one third of these respondents (n=16/52, 31%) stated that they had not discussed, or had no plans to discuss, policies or programmes which could influence population dynamics. More than twice as many responded affirmatively (n=36/52, 69%), citing a diverse range of topics (policies or programmes) that they indicated had the potential to influence human population dynamics. We organised these topics into seven themes, summarised in Table 6.

Table 6. Participant-identified themes discussed with students that have potential to influence population dynamics (online survey)[a]

	Theme	Policies, programmes or topics identified by participants
1	Social inequality	Poverty, inequities, immigration, social justice, segregation, exclusion;
2	SRHR and fertility	Sexual and reproductive health and rights, abortion, gender, education, pronatalism/anti-natalism, China's One Child Policy;
3	Land planning	Land use, land ownership, urban planning, urbanisation;

4	Environment and economies	Environmental and economic policies, marine protected areas, workforce, trade;
5	Demography	Population aging, age structure;
6	Health and human resources	Health care training, migration of healthcare workers to high-income countries;
7	Planetary boundaries	Population policies, over-consumption, environment.

[a] Note: themes identified based on open responses to the question 'Which policies or programs with potential to influence human population dynamics have you discussed – or do you plan to discuss – with students?' by 33 survey respondents.

The survey respondents who (a) had integrated population dynamics in their teaching but (b) had not discussed or who had no plans to discuss policies or programmes which could influence population dynamics (n=16 respondents) were asked to select one of three options to better understand their motivations. Half of this group (n=8/16) responded that this topic of human population dynamics was not pertinent to their primary subject matter, while the other half (n=8/16) responded that it landed beyond their area of expertise. No respondent selected the third option 'There is no evidence that population dynamics can (or should) be influenced.'

Connecting with students

When asked about their level of comfort discussing the topic of human population dynamics with students, nearly half of survey respondents (n=59/125, 47%) reported being comfortable or open to discussing the topic, with two of these respondents qualifying that they would be comfortable discussing certain aspects of the topic. Eleven per cent (n=14/125) were neutral, responding 'Neither comfortable nor uncomfortable'. Only one survey respondent (n=1/125, 1%) reported being uncomfortable discussing the topic with students. Fifty-one survey respondents (41%) did not provide an answer.

The interviews revealed participants' keen awareness of the sensitivity the subject matter and shed light on how they navigated its inclusion in their courses. Most interview participants seem to have made an effort to adapt the content to align with their students' interests. Several participants expressed that it was

easier to connect with students on demography as it applies to contemporary social, economic and political issues. For example, topics such as migration, immigration and racism struck a personal chord with students who came from families that have recently immigrated to the US. Other interview participants mentioned climate change, social justice and peace as priority issues for today's college students, and suggested that these topics could serve as a point of entry to introduce the concept of population dynamics.

Other interview participants expressed discomfort due to the political sensitivity of the topic. They include it but treat it gingerly and avoid delving into the politics associated with it. One participant commented:

> Discussion of population dynamics is very present throughout the ten weeks of my class, but I don't necessarily talk about it every single time – it's more of a connection point that I touch upon. I try not to get too political because I don't think my class is the place. But we definitely talk about it. (Interview participant #2, Biology/Public Health)

Reasons for non-inclusion

All survey respondents were invited to select from a list of potential reasons why it may be difficult for some faculty to discuss this topic. They could select up to three reasons out of six, including writing their own response. The most commonly selected reasons were: 'Many faculty lack training in demography/population sciences' (n=68/125, 54%), followed by 'Potential for divisiveness: students' comments might offend fellow students' (n=34/125, 27%), and 'Lack of consensus among experts on solutions to population-related problems' (n=31/125, 25%). Table 7 displays these findings.

Table 7. Participant-identified challenges in discussing population dynamics in the classroom (online survey)

	n	%
Many faculty lack training in demography / population sciences	68	54
Potential for divisiveness: students' comments might offend fellow students	34	27

Lack of consensus among experts on solutions to population-related problems	31	25
Topic seems too personal (e.g. human fertility, mortality)	23	18
It could distract students from their focus on the subject matter of the class	17	14
Othera	23	18
No response given	27	22

Note: Multiple responses were possible: survey respondents could select up to three responses, including writing their own response. Percentages calculated based on the total number of respondents (n=125).
[a] Other responses included: topic is not central to learning material; topic is too politically sensitive; time constraints; topic too complex or controversial

Challenge of prioritisation

Throughout the survey, the large majority of respondents expressed that population dynamics topics were important for students to understand, and very few respondents felt that population dynamics fell entirely outside the scope of their teaching. However, when participants were probed further in the interviews, there was no clear consensus on whether the topic should be taught as a dedicated class or integrated across subjects.

Participants in both the survey and the interviews explained that the shortage of time and the need for a nuanced discussion of this complex topic made integration difficult. Many also stressed their inability to adequately cover the topic given the large thematic scope of their courses.

Interview participant #2, who teaches in Biology and Public Health, stated:

> The only concern that I have is all the content that I need to cover in a limited time frame, and sometimes it is difficult to accommodate anything extra, if you want to cover the basics.

In an open question answer, survey respondent #80 from Economics argued that: 'population dynamics would be better taught as a separate class because of the time needed to cover the required subjects and all of the nuances within'. Survey respondent #110 from Environmental Studies concurred:

> As junior faculty creating new interdisciplinary courses, I'm maxed out on the number of different fields I can properly represent in the new course material. If the quality of faculty teaching were an actual priority for UC, then maybe I'd take the time to do this, but it's not.

However, despite these challenges, a majority of survey respondents took the initiative to integrate aspects of population dynamics into their course material (see 'Inclusion in courses' subsection above).

Challenge of Integration

With regards to the challenges of integrating these topics into teaching, two factors that emerged were the complexity and interdisciplinarity of population dynamics. Participants across the survey and interviews commented on the difficulty of handling a topic outside of their area of expertise and the challenge of explaining certain concepts to students, such as population pyramids or population momentum. In the absence of institutional directives, it required a significant level of commitment and initiative to integrate this topic into their primary subject matter.

Several interview participants mentioned the challenge of conveying demographic concepts to undergraduates, especially those who lack training in science, technology, engineering, and mathematics (STEM). As interview participant #11 from Biology and Public Health stated: 'Most of us are covering the topic of population in a very condensed way, in one section of one module. It's one of the more difficult modules for undergraduate students.' This participant consistently observed that demographic concepts and tools, such as population pyramids, are challenging for students to grasp.

Risk of controversy

Population dynamics can be contentious. Some faculty had concerns that it could easily align with messages they do not support. For example, the role of population growth and human consumption in environmental degradation can polarise classrooms. Survey respondent #7 from Public Health expressed a

desire 'not to wade into Malthusian debates'[7] and survey respondent #39 from Environmental Studies reported a hesitation to discuss population in relation to the environment, in part due to the 'problematic history of perspectives like "The Population Bomb",[8] which focused on population growth rather than per capita resource use'. Survey respondent #64 from Environmental Studies explained the dilemma:

> The main reason I believe it's difficult is that students often go to the most basic 'solutions' (reduce human population) instead of the more nuanced and evidenced solutions. Environmental degradation has more to do with consumption, property, management, and other choices than simple human existence.

Interview participant #9 from Environmental Sciences confirmed the difficulty: 'The challenge is: how do we make it something that we can talk about, and in a way that is respectful to all human value systems?'

Malthusian ideas, population control policies, reproductive coercion, eugenics and racism were primary areas of concern. Survey respondent #43 from Biology explains: 'In the environmental/ecological literature, there is a lot of racism and "eugenics-like" ideas when it comes to population growth and its consequences.' Survey respondent #45, from Environmental Studies, feared that discussions of population dynamics could reinforce prevailing misconceptions, and noted that many of these misconceptions were already present among faculty peers.

Sensitive topics included migration and immigration: 'The political climate in the US makes migration/immigration a sensitive topic' (Survey respondent #49, from Public Health). Other participants mentioned topics of reproductive health and rights, and population aging as being sensitive.

7 Economist Thomas Malthus is the figure most associated with debates about population and resources. In some circles, 'Malthusian' has become a derogatory term, referring to discourses that attribute environmental pressures to the high fertility of certain population groups, particularly people of colour or the poor, thereby diverting attention from the structural roots of inequality and overconsumption (Scranton, 2025).

8 *The Population Bomb* is the title of a book by Paul and Anne Ehrlich (1968) which predicted that the rapid increase in human population would surpass the earth's capacity to support human life, leading to catastrophic events.

Fear of upsetting students was another recurrent theme, as illustrated by the following quotes: 'My comments may upset the students. I've already been told that playing devil's advocate is a mode of gaslighting'; and 'If we do not use what the kids deem to be "inclusive" language, they file grievances and create loads of administrative work.' (Survey respondent #34, from Public Health)

Support for faculty is needed

The absence of adequate teaching resources, best practice guidelines and lack of training arose as barriers to integrating population dynamics into coursework. Some participants were in favour of structural changes at the university level to create dedicated classes on the topic, while others were interested in learning more themselves, such as interview participant #2 from Biology and Public Health, who stated,

> I don't consider myself an expert on population dynamics. So I will probably leave things out just because I am not familiar with the topic. I try to talk about it and use it as a connecting point for the different topics we discuss, but I would like to become more knowledgeable about it.

Many participants voiced a personal commitment to interdisciplinarity and emphasised the importance of creativity in their teaching. Interview participant #1 from Sociology stated,

> If you really believe in population dynamics as an important worldview, or an important set of skills, you make it happen. Even if there isn't an infrastructure [for teaching this topic] on your campus...

Discussion

Despite its small size, we believe that our study reveals three central themes associated with the teaching of population dynamics in the UC system. First, there are faculty members, including the majority of the participants in this study, who consider the topic of high importance. Second, even among participants who recognise the importance of the topic, it is largely neglected in UC undergraduate curricula. Third, the scope and meaning associated with population dynamics varies greatly across disciplines and individuals.

The majority of participants highlighted the importance of population dynamics in addressing broad societal goals, such as population and environmental wellbeing, equity, and sustainability. This is an important finding, since the topic has become particularly relevant with rising global inequalities, and in light of the current environmental and climate crises (Wilmoth et al., 2022).

The interdisciplinary nature of population dynamics was exemplified both by the different meanings associated with the concept and by the different topics associated with its teaching. The study of demography is inherently interdisciplinary, with relevance to economics, sociology, anthropology, epidemiology, geography, public health, biology, ecology and environmental science, among others (McDonald, 2014). Accordingly, participants in this study tended to express a conception of population dynamics as a broader spectrum of inquiry, rather than a limited set of demographic tools and processes. Traditionally, demography focused on measuring and statistically analysing population trends (Tabutin and Depledge, 2007). However, broadening the field to address complex modern challenges has concrete benefits. In his essay on the teaching of democracy, Burch (2018) explained,

> We can rest content with being and being seen as technicians, doing 'demographic accounting.' We can leave many of the most important population problems of the day to others, accepting demography as a small sub-discipline of statistics, economics, sociology, or environmental science. Or we can develop and promote demography as a distinct and autonomous science – an extensive, coherent, and empirically grounded body of knowledge about how populations work, and how demographic dynamics are related to society, the economy and the environment. (p. 155)

The norm in demographic inquiry today has broadened into a multidisciplinary field (Merli et al., 2023). Demographers do far more than measure population data – they also raise questions about why population-level changes occur, and with what consequences in the short and longer terms. Their perspective and analyses help predict and prepare for demographic changes, and institute policies and programmes that can lead to better outcomes for human populations, wildlife and their shared environment (Weeks, 2020).

Our study also highlights that the extent to which population dynamics is taught predominantly depends on the preferences of professors from different disciplines, who possess varying levels of knowledge in demography. This situation risks presenting students with an incomplete and fragmented picture of population dynamics. Our study reveals a lack of coherence in the teaching of this subject among participants, with no systematic effort in place to ensure a structured and intentional focus on population dynamics within the curricula of the UC. It is possible that faculty members themselves may have received only minimal training in the subject, and that their views on the topic may not be well grounded in evidence. A more strategic approach to the inclusion of population dynamics in the relevant curricula may be warranted to promote more systematic and evidence-informed instruction on the topic.

Demography as a discipline occupies a unique position both as a field of scholarly inquiry and in how it is taught and situated within university systems – one that is rarely delivered as a standalone field of study and is instead dispersed across a range of departments, contributing to fragmented ownership, reduced disciplinary visibility and specific teaching challenges. Universities frequently integrate demographic studies into other academic domains without consistent recognition of demography as an independent discipline in its own right (Tabutin and Depledge, 2007). Palloni (2002) explains:

> Because the contours of what is properly demographic are narrow and confined, a teaching program solely devoted to demography could not possibly extend to more than a few semesters or even a single academic year. Thus, with notable exceptions in Europe, demography becomes a willing prisoner of the teaching schemes of other disciplines, those well cemented in academic institutions, and with strong ties to professional markets where they offer viable and tested products. (p. 41)

However, the absence of a dedicated and coordinated approach to teaching population dynamics stands out as a missed opportunity for UC.

Overall, this study shows that, even among faculty members who recognise the importance of the topic of population dynamics, it is largely neglected in UC curricula. The extent to which participants incorporated this subject into their

teaching did not match the significance they attributed to it. This discrepancy can be explained by the many barriers to teaching population dynamics at the university level. Managing interdisciplinarity, lack of expertise in the field, little to no institutional support and lack of time were key barriers.

These difficulties were compounded by the perceived complexity of population dynamics. The data-focused, technical and empirical nature of this field of study made it a difficult subject to integrate into other courses. Another layer of complexity stemmed from the controversial nature of population dynamics. This phenomenon is well-documented in the policy and scientific spheres, as discussions of population dynamics tend to be avoided or downplayed because of their sensitive nature (Coole, 2021; Delacroix and Engelman, 2023).

There are numerous opportunities to enhance education and training in population studies. One approach is to scale up the work of existing population research centres and organisations, such as the Association of Population Centers (https://www.popcenters.org/) and Population Association of America (https://www.populationassociation.org/). Additionally, targeted efforts to integrate demography into US undergraduate curricula are emerging. An example of this is the 'NextGenPop' summer programme, a collaborative effort involving six American universities: University of Wisconsin-Madison, Cornell University, Duke University, Johns Hopkins University, UC at Irvine and University of Minnesota. This initiative was designed to address the lack of racial and ethnic diversity among scholars of population and to build a pipeline into demography for historically underrepresented undergraduate students (NextGenPop, 2024).

Strengths and limitations

This study was an opportunity to present empirical findings on the inclusion of demographic concepts in undergraduate curricula. As one of the first studies to explore this topic in the context of a system of major American universities, it has revealed important themes and areas for further inquiry. In particular, the study points to the need for further research to map how population dynamics is regarded across other contexts, such as other disciplines, levels of study and geographical locations, and by other populations, such as students themselves.

In total, the online survey was completed by 125 respondents. All UC campuses were represented in the survey, and a majority of campuses were represented in the interview pool. While this sample provided valuable insights into our study questions, the response rate may be viewed as low (given that more than 2,000 invitation emails were distributed, resulting in a participation rate of less than ten per cent). Our recruitment method, however, was not determined using a sample framework and was not aiming to be representative. We relied on email addresses sourced from faculty website (which may not have been up to date), and we did not pre-screen for eligibility. Further, invitations may have gone to junk mail folders. Finally, because the scope of the project only included campuses from the UC system, the findings are not generalisable outside of this context.

Another limitation of the study was the exclusion of four academic fields, including sociology. It is possible that we may have missed instances of population dynamics being taught in these other fields (although there is no prior evidence to suggest that findings from these fields differ from the fields included in the study). In hindsight, given the high relevance of population dynamics to sociology, it would have been beneficial to include this field, though some participants had multidisciplinary backgrounds that included sociology.

Since the topic of population dynamics is not a high priority for many faculty, those who are particularly interested in population dynamics may have been more inclined to respond, creating a response bias. Another limitation was selection bias, as we restricted our inquiry to eight broad fields for feasibility reasons.

A final limitation of our study was investigator bias. All researchers participating in this study believe that building demographic awareness and sharpening demographic skills is essential for the next generation of policymakers, practitioners, researchers and professors. Cognisant of these biases, the study team took great care to frame the survey and interview questions in a neutral manner.

Conclusion and recommendations

This study offers important insights into the ways in which the topic of population dynamics is integrated within university curricula. First, population dynamics as a thematic focus seems to be neglected across disciplinary fields. Contributing

factors may include: its interdisciplinary nature, few opportunities for faculty training, lack of endorsement as an essential topic to teach and the sensitive nature of associated themes, both political and intimate, such as immigration, family planning and gender norms. We also found a lack of coherence in the ways in which population dynamics were interpreted by study participants and taught to students, and an absence of structured and intentional focus on this subject. The study hints at a disconnect between the high perceived importance of population dynamics by faculty, and the low level of which this field of inquiry seems to be integrated into UC curricula.

Our study corroborates existing data sources that assert population dynamics have important implications for social justice and equity, as well as for environmental sustainability. By not integrating population dynamics within university curricula, students are hindered from acquiring essential skills and tools that could help them grasp the complexities of these modern challenges. Failing to equip our future leaders with this foundational knowledge diminishes our ability to develop and enact effective policies to address the interconnected crises the world is facing today. For these reasons, we call on educational institutions to make efforts to integrate content on population dynamics across disciplinary fields and to provide faculty with the support and resources needed to address this topic effectively. Future research is needed to explore students' perspectives on the topic, and to understand how demography is being taught to undergraduates and graduate students, how the topic is being integrated beyond the UC system and how to overcome barriers to its integration.

References

Burch, T.K. (2018). 'Teaching demography: Ten principles and two rationales'. In T.K. Burch (ed.) *Model-Based Demography: Essays on Integrating Data, Technique and Theory*, pp. 155–66. Springer International Publishing. https://doi.org/10.1007/978-3-319-65433-8_11

Coole, D. 2021. 'The toxification of population discourse. A genealogical study'. *The Journal of Development Studies* **57** (9): 1454–69. https://doi.org/10.1080/00220388.2021.1915479

Delacroix, C. and R. Engelman. 2023. 'Empowered, smaller families are better for the planet: How to talk about family planning and environmental sustainability'. *Social Change* **53** (3): 364–82. https://doi.org/10.1177/00490857231187993

Ehrlich, P.R. 1968. *The Population Bomb.* New York. Ballantine Book Publication.

McDonald, P. 2014. 'What is demography?' *International Union for the Scientific Study of Population*. https://iussp.org/en/what-demography-peter-mcdonald

McFarlane, D.R. and W.L. Hansen. 2023. *Assessing Basic Demographic Literacy Among Undergraduate Political Science Students: Why It Matters and How to Improve It*. Annual Meeting of the Midwest Political Science Association, Chicago, April.

Merli, M.G., J. Moody, A. Verdery and M. Yacoub. 2023. 'Demography's changing intellectual landscape: A bibliometric analysis of the leading Anglophone journals, 1950–2020'. *Demography* **60** (3): 865–890. https://doi.org/10.1215/00703370-10714127

NextGenPop. 2024. NextGenPop. https://nextgenpop.org/

O'Neill, B.C., M. Dalton, R. Fuchs, L. Jiang, S. Pachauri and K. Zigova. 2010. 'Global demographic trends and future carbon emissions'. *Proceedings of the National Academy of Sciences of the United States of America* **107** (41): 17521–26. https://doi.org/10.1073/pnas.1004581107

Palloni, A. 2002. 'Rethinking the teaching of demography: New challenges and opportunities'. *Genus* **58** (3/4): 35–70.

Ripple, W.J., C. Wolf, J.W. Gregg, K. Levin … and L. Kemp. 2022. *World Scientists' Warning of a Climate Emergency 2022*. Oxford University Press. https://academic.oup.com/bioscience/article-abstract/72/12/1149/6764747

Ripple, W.J., C. Wolf, J.W. Gregg, J. Rockström … and S.D.A. King. 2023. 'The 2023 state of the climate report: Entering uncharted territory'. *BioScience* **73** (12): 841–50. https://doi.org/10.1093/biosci/biad080

Scranton, R. 2025. 'Misunderstood Malthus: The English thinker whose name is synonymous with doom and gloom has lessons for today'. *The Conversation*, 22 August. https://doi.org/10.64628/AAI.vy5nhngr9

Speidel, J.J. and J.N. Sullivan. 2023. 'Advancing the welfare of people and the planet with a common agenda for reproductive justice, population, and the environment'. *World* **4** (2): 259–87. https://doi.org/10.3390/world4020018

Tabutin, D. and R. Depledge. 2007. 'Whither demography? Strengths and weaknesses of the discipline over fifty years of change'. *Population* **62** (1): 15–31. https://doi.org/10.3917/pope.701.0015

Turchin, P. 2003. *Complex Population Dynamics: A Theoretical/empirical Synthesis*. Princeton: Princeton University Press.

United Nations Department of Economic and Social Affairs. 2024. *World Population Prospects 2024: Summary of Results*. https://population.un.org/wpp/assets/Files/WPP2024_Summary-of-Results.pdf

Weeks, J.R. 2020. *Population: An Introduction to Concepts and Issues*, 13th edition. Cengage Learning.

Wilmoth, J., C. Menozzi and L. Bassarsky. 2022. *Why Population Growth Matters for Sustainable Development* (Policy Brief 130; Future of the World). United Nations Department of Economic and Social Affairs. https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/undesa_pd_2022_policy_brief_population_growth.pdf

APPENDIX A

Survey: Inclusion of the Topic of Human Population Dynamics in University of California Classrooms

Default Question Block

Inclusion of the topic of human population dynamics in University of California classrooms CPHS # 2022-02-15049

You are invited to take part in this research study led by Dr. Ndola Prata of UC Berkeley and Dr. Celine Delacroix of the University of Ottawa. The study aims to determine how the subject of human population dynamics is integrated into courses across the University of California system.

You are eligible to participate in this 10-12 minute survey if you teach undergraduate or graduate students on any UC campus with a focus on one of these eight fields of study: biology, economics, environmental sciences, gender studies, geography/urban planning, global studies, political science/public policy or public health.

If you agree to participate in a follow up interview, and/or if you wish to see the final results of the study, you will be requested to provide your contact information. Your contact information will not be used for any other purpose other than what you have indicated.

There is no direct benefit to you from taking part in this study, other than possible insight into how population relates to your field of expertise. You will not be paid for taking part in this study. If any of the survey questions make you uncomfortable, you are free to stop participating in the survey at any time.

Your study data will be stored on secure systems that can only be accessed by the study team. When publishing the results of this study, data will be aggregated and names (and other identifying information) will be removed or masked.

Open-ended responses may be quoted, unless respondents indicate that they prefer not to have their response quoted by typing "Please do not quote" before the response.

Participation in research is completely voluntary. You are free to decline to take part in the project – and there will be no penalty to you or loss of benefits to which you are otherwise entitled.

Questions

If you have any questions about this research, please contact Paige Passano or Ndola Prata.

If you have any questions about your rights or treatment as a research participant in this study, please call UC Berkeley's Office for the Protection of Human Subjects at 510-642-7461, in reference to study protocol 2022-02-15049, or email subjects@berkeley.edu.

We welcome new participants into this study. Please feel free to share the email invitation email with anyone across the UC system who is teaching undergraduates or graduates in the fields of biology, economics, environmental sciences, gender studies, geography/urban planning, global studies,political science/public policy or public health.

☐ Accept ☐ Decline

Inclusion of the topic of human population dynamics in University of California classrooms Part 1 of 4: Background

Which UC campus is your primary affiliation?

- [ ] Berkeley Davis Irvine
- [ ] Los Angeles Merced Riverside San Diego
- [ ] Santa Barbara Santa Cruz San Francisco
- [ ] Which field is most relevant to your faculty position?
- [ ] Biology Economics
- [ ] Environmental Studies Gender/Women's/Sexuality Studies Global Studies
- [ ] Geography/Urban Planning Political Science/Public Policy Public Health
- [ ] Other

Which level of students do you teach?

- [ ] Undergraduate students Graduate students
- [ ] Both undergraduate and graduate students
- [ ] Other

Please list all of the required "core" courses that you are teaching this academic year (2022–23) and those that you taught last year (2021–22). Please include required course numbers and names.

Course number/Course name

Course number/Course name

Course number/Course name

Course number/Course name

Course number/Course name

Course number/Course name

I did not teach any core courses during this period.

Please list all of the **non-required "elective" courses** that you are teaching this academic year (2022–23) and those that you taught last year (2021–22). Please include elective course numbers and names.

Course number/Course name

Course number/Course name

Course number/Course name

Course number/Course name

Course number/Course name

Course number/Course name

I did not teach any non-required/elective courses in this time period.

Inclusion of the topic of human population dynamics in University of California classrooms Part 2 of 4: Interactions with Students

Among the four topics listed below, do you think some (or all) of these are important for your students to understand?

a) Human population growth
b) Human population age structure (ratio of dependents to workers)
c) Human migration
d) Human population decline

☐ Yes, I believe some or all of these topics are important for my students to understand.

☐ No, I do not think these topics are important for my students to understand

☐ I am not sure about the relative importance of these topics for my students

How important is it for students in your field to understand the following topics?

	Very important	Important	Somewhat Important	Not important	Not sure
Human population growth	☐	☐	☐	☐	☐
Human population age structure (ratio of dependents to workers)	☐	☐	☐	☐	☐
Human migration	☐	☐	☐	☐	☐
Human population decline	☐	☐	☐	☐	☐

Human population dynamics have implications for society that can be sensitive and political. Which of the following reasons might make it difficult for faculty to discuss this topic in the classroom? (*Mark up to three responses, or write your own response.*)

☐ Many faculty lack training in demography/ population sciences

☐ Topic seems too personal (human fertility and mortality)

☐ Potential for divisiveness: students' comments might offend fellow students

☐ Lack of consensus among experts on solutions to population-related problems

☐ It could distract students from their focus on the subject matter of the class

☐ Other/Comment ☐

Did you discuss, or do you plan to discuss, the topic of human population dynamics* in any of the courses or guest lectures that you are teaching this academic year (2022–23) or in the prior year (2021–22)?

*Human population dynamics includes: human population size, age structure (ratio of dependents to workers), rates of change (growth/decline) and migration.

☐ Yes ☐ No

Which of the following best describes the reason you have not discussed the topic of human population dynamics with your students in the last two academic years?

- [ ] This topic is not directly relevant to my course material
- [ ] This topic is outside of my area of expertise
- [ ] I do not wish to integrate this topic into my course material
- [ ] I don't have a connection with a qualified faculty member who could guest lecture on this topic
- [ ] Other/Comment _____

(Optional) Please complete the following information for any guest lectures you did this academic year (2022–23) or last year (2021–22) in which you spoke about population. If you taught multiple guest lectures on the topic, please include all courses, **separating each piece of information with a slash(/).** Write "DK" for any information that you cannot recall. If not applicable, please skip this question.

Course name(s) _____

Department(s) _____

Lead Professor(s) name(s) _____

Across all the courses that you teach, to what extent do you integrate the topic of human population dynamics?

- [ ] Minimally (mentioned in one session per course taught)
- [ ] Moderately (mentioned in multiple sessions per course taught)
- [ ] Substantially (part of course objectives)

How comfortable are you discussing this topic with students?

- [ ] Uncomfortable
- [ ] Neither comfortable nor uncomfortable
- [ ] Comfortable
- [ ] Haven't discussed this topic, but I am open to doing so
- [ ] Haven't discussed this topic and I don't plan to do so
- [ ] Other/Comment

When you discuss human population dynamics in the courses that you teach, which topics do you discuss in conjunction with this topic? (Mark all that apply.)

- [ ] Climate change
- [ ] Economy/Employment
- [ ] Education
- [ ] Elder care
- [ ] Environment/ Natural resources
- [ ] Ethics
- [ ] Health / Healthcare
- [ ] Human rights
- [ ] Migration
- [ ] Policy and planning
- [ ] Political stability/ Instability
- [ ] Poverty/ Food security
- [ ] Racism / Xenophobia
- [ ] Reproductive health and rights / Family planning
- [ ] Women's self-determination
- [ ] Other topic(s)

How important are population dynamics in terms of achieving the following societal goals?

	Not important	Below average importance	Average importance	Above average importance	Critical importance
Ecosystem preservation/ restoration	☐	☐	☐	☐	☐
Climate resilience	☐	☐	☐	☐	☐
Protection of endangered species	☐	☐	☐	☐	☐
Gender equity	☐	☐	☐	☐	☐
Poverty alleviation	☐	☐	☐	☐	☐
Healthcare access	☐	☐	☐	☐	☐
Economic development	☐	☐	☐	☐	☐

Inclusion of the topic of human population dynamics in University of California classrooms Part 3 of 4: Influences on human population dynamics

The following questions are aimed at faculty who *are* teaching about human population dynamics. If you are *not* teaching on this topic, please click no.

☐ Yes, I teach on this topic

☐ No, I dont teach on this topic

In any of the classes that you taught this academic year (2022–23) or last year (2021–22) did you discuss – or do you plan to discuss – any **policies or programs** which might influence human population dynamics?

☐ Yes ☐ No

In a few words or phrases, which **policies or programs** with potential to influence human population dynamics have you discussed – or do you plan to discuss – with students?

When you talk about population with students, can you explain why you do not mention any policies or programs that could influence population dynamics?

- ☐ This is not relevant to the topic I am teaching
- ☐ This topic is outside of my area of expertise
- ☐ There is no evidence that human population dynamics can or should be influenced
- ☐ Other/Comment

We plan to interview a subset of faculty to gain a deeper understanding about their decisions to integrate human population dynamics into their courses. For those who have included this topic, we would like to learn how it is being done, and about students' response.

Would you be willing to participate in a 20-minute phone interview in the next two months?

☐ Yes ☐ No

To contact you for the interview, please write your name and preferred method of contact – email or phone. (Your contact information will only be used to help coordinate the interview).

Last name, first name

Email address or phone number (Contact information written here will only be used to arrange the interview)

Inclusion of the topic of human population dynamics in University of California classrooms Part 4 of 4: Demographic questions

Thank you for completing the main part of our survey. Please complete the last five questions.

Please indicate your age bracket.

- ☐ Under 35
- ☐ 36-50
- ☐ 51-65
- ☐ Over 65
- ☐ Prefer not to answer

Which best describes your gender?

- ☐ Man
- ☐ Woman
- ☐ Non-binary / Genderqueer
- ☐ Prefer not to answer
- ☐ Preferred identification: _____

Do you identify as a person of color?

- ☐ Yes ☐ No
- ☐ Prefer not to answer
- ☐ Preferred identification: _____

Would you like to receive the results of this survey once they have been written up?

☐ No, thank you.

☐ Yes. Please enter your email address below
(Your email will only be used once to share the results)

(Optional) Feel free to share the email invitation for this survey with your networks. Also, if you know of any centers, departments, or individuals on your campus that may be interested in the findings of this study, please write their name(s) here.

We thank you for your time spent taking this survey.

APPENDIX B

Interview Guide for study entitled 'Inclusion of the topic of human population dynamics in University of California classrooms'.

Thank you for taking the time to participate in this interview. Your insights and experiences as a faculty member who includes this topic into your courses will be invaluable to our research.

*Introduce self, study title (*above) and objective: To understand to what degree – and how – the topic of human population dynamics is being integrated into six fields of study across the UC System – and to learn more from faculty about the importance of this topic for students in their own field of study.

Participant rights + recording Before we begin, I want to assure you that your participation is voluntary, and any information you provide will be kept confidential. Please feel free to ask any questions or seek clarification at any point. With your permission, I'd like to record the interview to ensure accuracy of our data. *All recordings and transcripts will be de-identified by the study team and any data shared in our results will not be linked to specific participants.*

May I have your permission to record this call?

1. There are a lot of different definitions of population dynamics. When you hear the term, what topics come to mind?

2. Why do you feel it's important to bring your students' attention to population dynamics?

3. Do you think this topic receives adequate attention in the university curricula? Please explain.

4. Within the topic of population dynamics, which subtopics do you think are especially important for students taking introductory courses in your field? Why is this important?

5. Tell me more about the linkages that you make for your students between your course material and the topic of population dynamics.

6. Tell me about the response you have received from students when you have discussed population dynamics.

7. Do you wish to talk more about population dynamics in your class?

8. Probe: If so, how do you plan to do this? Do you feel equipped to do this?

9. Is there anything else you would like to add? Is there anything you are surprised that I haven't asked you?