# POPULATION GEOGRAPHY

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**Contents**





**Summary**

This chapter provides an overview of the field of population geography. Population geography is a subfield of the discipline of geography and a subfield of the discipline of demography. Population geography addresses the spatial distribution, characteristics, and spatial variation of the population. The importance of a spatial perspective for demographic research has received considerable attention over the past few decades. Population geography addresses demographic issues and population processes in an explicitly spatial manner, with a focus on the connection between people and places. Spatial demography refers to the formal methods used to make these links. Geographic concepts and spatial thinking are described, with particular attention given to the concept of scale.

The chapter reviews the intellectual heritage of population geography and explains the contemporary correspondence between population geography and spatial demography. Conceptions of space and place in population geography are quite sophisticated, and recent advancements in spatial analysis have been enabled by geographic information systems, software development, and the availability of spatially explicit data (geocoded) sources. A host of methods of population geography are detailed, giving particular attention to the recent development of local, as opposed to global, measures of spatial analysis. Methods are reviewed for the study of geographic distribution, population movement, and spatial analysis.

Traditionally, population geographers addressed the three components of population change – fertility, mortality, and migration, only. However, contemporary population geography is more thematic and theoretically sophisticated. Various recent contributions

to population geography are reviewed and serve as exemplars of the themes of study. Life course studies, intergenerational proximity and mobility, and gendered migration are discussed. By embracing theoretical and future challenges, population geography is poised to make important contributions to our understanding of people and places.

## 1. Introduction

September, 2004 marked the 150th anniversary of John Snow and the infamous water pump handle. On August 31, 1854, there was a recurrent epidemic of cholera in London, England. Suspecting that cholera was a waterborne contagious disease, Snow mapped the distribution of cholera deaths surrounding the Broad Street pump which he suspected as the source of the disease. Snow (1849) reviewed death records of area residents who died from cholera and interviewed household members. He determined that most of the people having died from cholera lived near and had drunk water from the pump. Snow presented his findings to community leaders and the pump handle was removed on September 8, 1854, preventing additional cholera deaths. Often Snow is heralded as a legendary figure in epidemiology because he provided one of the earliest examples of using epidemiologic methods to study factors affecting the health and illness of populations. His study advanced preventative action in the interest of public health. Snow is also heralded as a legendary figure in population geography for he provides one of the earliest examples of the power of the map to reveal spatial relationships and demographic processes.

Other early scientists used similar methods of mapping spatial distributions to examine demographic phenomena. Mayhew (1861) mapped the incidence of crime in London along with urbanization, poverty and disease. In the late 1880s, Charles Booth (1902) was one of the initial scientists to map social and spatial distance based on his personal observations of neighborhood differences in London. At the same time, Florence Kelley conducted a similar study by mapping poverty in the slums of Chicago. From her field research Kelley learned that frequently several families were sharing the same housing unit. Kelley was amongst the first to use cartograms to represent family density in housing (CSISS, 2008). As these studies indicate, maps have enormous analytical potential. Traditionally, maps have served a valuable role in understanding demographic characteristics and events. Maps represent the geographic epistemology – thinking spatially. These scientists were pioneers of population geography and spatial demography.

Population geography addresses the spatial distribution, characteristics, and variation of the population. Often, the terms population geography and spatial demography are used interchangeably. More specifically, however, population geography is a sub-disciplinary field of geographic research that addresses demographic issues and population processes in an explicitly spatial manner, with a focus on the connection between people and places. Spatial demography, while similar to population geography, is the term usually used to refer to the formal empirical methods used to make these connections between people and places. The importance of a spatial perspective for demographic research has received considerable attention over the past few decades. Geographers were amongst the first, but not the only population scientists, to embrace the importance of spatial thinking. Today, population geography is a subfield of the discipline of Geography. It is

also a subfield of Demography.

This chapter provides an overview of population geography. Section two describes important geographic concepts and spatial thinking, particularly the concept of scale. It then reviews the intellectual heritage of population geography. Population geography is comprised of both a field of study and methods of inquiry. The chapter then addresses the contemporary correspondence between population geography and spatial demography. The significant role of Geographic Information Systems is discussed, and special attention is given to demographic processes and their spatial context. Section three describes the methods of population geography. Population geographers embrace sophisticated conception of space and place. Particular attention is given to the recent development of local, as opposed to global, measures of spatial association. Substantive areas of research in population geography are reviewed in Section four. Traditionally, population geographers have addressed the three components of population change – fertility, mortality, and migration. Contemporary population geography has become more thematic and theoretically sophisticated. This section reviews exemplars of recent themes in population geography. Section five concludes with an assessment of theoretical challenges and future directions where population geography is poised to make important contributions. Some issues also related to the geographic/spatial aspects of population are addressed in other chapters in this volume. Small area demography is addressed in Chapter 11 on applied demography, multi-regional population projection is addressed in chapter 16 on multistate demography, and population projection by countries and geographical regions of the world is addressed in chapter 22.

## 2. Population Geography and Contemporary Spatial Demography

There are three primary themes within a geographic perspective: spatial variation, human-environment interaction, and place-based populations. Geographers are interested in spatial variation, aiming to understand how and why things differ from place to place across the landscape. Geographers are interested in understanding how spatial patterns evolve over time. Central to the study of Geography is the interaction between humans and the environment, both the impact of the physical environment on society and the ways in which people adapt and change their natural environment over time. The third theme considers the well-being of place-based populations and the characteristics of places and regions. Population geography brings all three of these themes to the comprehensive study of people and places.

### 2.1. Geographic Concepts and Spatial Thinking

Location is the most basic geographic concept– where is a place? Yet, even this is a difficult question to answer in the absence of other aspects of spatial thinking. Two of the most fundamental geographic concepts are site and situation. Site refers to the characteristic features of a place, whereas situation refers to the way in which a place is connected to other places either by natural processes or by human processes, such as transportation or communication. A geographer's fundamental assessment of the site and situation of a place is a much more sophisticated conception than one which depicts a place as merely a bounded area. For population geographers place is a complex term that invokes numerous dimensions of spatial thinking, including such concepts as

analog, association, aura, accessibility, comparison, condition, connection, diffusion, distance decay, distribution, exceptions, gradient, hierarchy, influence, interaction, mobility, pattern, proximity, region, relationships and of course, scale – from the global to the local (Gershmel, 2008). Tobler (1970) states that the first law of geography is that everything is related to everything else, but near things are more related than distant things.

Typically population geographers ask questions that connect demographic phenomenon over time and space. People and places are intricately interwoven, both spatially and temporally. It is common for population geographers to ask how places are similar or different. How does one place compare with another or with the nation or the world? How does an attribute affect the surrounding area? Are there regional variations in demographic phenomena? What is the nature of transitions between places? Are gradients gradual or abrupt? Are there spatial patterns such as imbalances, clustering, and distinctive patterns or is the phenomenon random in occurrence? Is there evidence of spatial associations or correlations? Are there places or locations that serve as exceptions to the rule or aberrations from typical places? And how do things spread through time across space? What avenues or barriers hinder or enhance diffusion? These are a few of the questions posed by population geographers thinking spatially (Gershmel, 2008). Understanding spatial variation in demographic phenomena is at the heart of population geography.

Population geographers have a heightened appreciation for the significance of scale. The scale of analysis determines geographic representation. It is seldom a question of which scale is right, rather which scale is appropriate. The important issue is to what extent the scale of analysis conditions the findings of a study. Some studies are best undertaken with a global perspective, such as those related to global climate, pandemics, and human rights. Others are distinctly the concerns of families and households, such a completed fertility. Spatial aggregation increases as the scale of analysis moves along the geographic hierarchy from people, to households, neighborhoods, cities, regions, nations, international associations and the global context. As well, there are numerous units of analysis that do not fit neatly into a geographic hierarchy as I have outlined. Stakeholders, congregations of people, unions of nations, are just a few examples of groups that transcend traditional scales.

The uncertainty associated with spatial aggregation is known formally as the modifiable area unit problem (MAUP). First described by Openshaw (1984), the areal units used in many geographical studies are arbitrary, modifiable, and subject to the caprice of the researcher conducting the aggregation. Researchers take a variety of approaches to contend with the modifiable area unit problem. Some studies conduct the same analysis at different levels of spatial aggregation to assess the relative sensitivity of their findings. Others intentionally jump scales to produce alternative knowledge. In population geography, as with other spatial sciences, the modifiable area unit problem is intertwined with the practical challenge of integrating data across geographic scales.

## 2.2. The Making of Population Geography

Population geography owes its formal beginnings as a sub-discipline of Geography to

the Presidential address given by Glen Trewartha at the annual meeting of the Association of American Geographers in 1953. At the time, Geography was divided into two areas, generally: Physical Geography and Cultural Geography. In his address, Trewartha presented an organizational triade for Geography comprised of population, the natural earth and the cultural earth. In more contemporary terminology this triade includes people, the physical environment, and the cultural environment. He placed the natural and cultural environments at the base and population at the top (Figure 1).

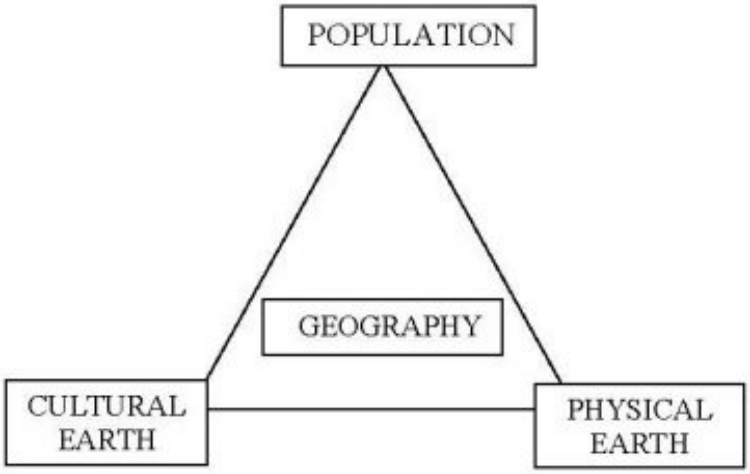


Figure 1. Trewartha's depiction of Population as the apex of the field of Geography.

Trewartha was a physical geographer and a climatologist. Trewartha was making the call for an anthropomorphic view of the geographical sciences. Population was what made the physical and cultural studies important. He was encouraging the scientific study of populations, particularly as they relate to the physical environment. In Trewartha's words, "Population is the point of reference from which all other elements are observed and from which they all, singly and collectively, derive significance and meaning. It is population which furnishes the focus." (Trewartha, 1953: 83).

In geographical texts it is commonplace to give Trewartha recognition as the one who initiated population geography (although it has not come to be the pinnacle of the discipline of Geography as Trewartha proposed). Trewartha made an impact on the discipline of geography, but he was not alone in working to establish population as a scientific field of study. The classic and the most influential book on demography "The Study of Population: An Inventory and Appraisal" by Hauser and Duncan (1959) includes a chapter titled Geography and Demography. Clearly, population geography is a typical interdisciplinary field of these two scientific disciplines.

Weeks (2004) is one of the few scholars to explain the larger context of Trewartha's address. Trewartha was at the University of Wisconsin which was, and still is, a vibrant environment for population studies. The call for the scientific study of population was being heralded throughout the academy. Moreover, the call was being heard! The Population Council, now a leading voice in policy-oriented research, was established by the Rockefellers at this time. As well, the International Union for the Scientific Study of

Population (IUSSP) was working with the United Nations to plan for the World Population Conference that was subsequently held in Rome in 1954.

Throughout the 1960s and 1970s population geography blossomed and, in a sense, came of age in the 1980s by which time it had become dominated by spatial analysis and quantitative methods. It was a sizeable sub-field of Geography whose domain was the scientific study of population. Notable in this development was the work of Wilbur Zelinsky. In his 1966 text A Prologue to Population Geography, Zelinsky distinguished the population geographer from the demographer in the following manner. He depicted the demographer as being "concerned with the intrinsic nature, the universal attributes, of populations, with the systematic principles governing their composition, socioeconomic correlates, behavior, and changes: the spatial is incidental to this purpose." In contrast, he described population geography as the "science that deals with the ways in which the geographic character of places is formed by, and in turn reacts upon, a set of population phenomena that vary within it through both space and time as they follow their own behavioral laws, interacting one with another and with numerous non-demographic phenomena." (Zelinsky, 1966:3).

The scientific study of population influenced other areas of Geography as well during the 1970s. The sub-field of medical geography (akin to spatial epidemiology) was established during the late 1970s. Melinda Mead's 1977 article in The Geographical Review titled "Medical Geography as Human Ecology: The Dimension of Population Movement," is frequently cited as the cornerstone of establishing medical geography as a sub-field in Geography. Interestingly, in this paper she includes a diagram that is essentially the same as Trewartha's triade, yet it focuses on health as the outcome of the dynamic interactions between the three dimensions of population, environment and culture. As well, the scientific study of population became a core concern of the sub-field of economic geography and the field of regional science. It was Hägerstrand who integrated people into regional science. Hägerstrand asserted that time and space were not independent of each other. His contribution was as eloquent as it was influential. His research focused on innovation diffusion as he studied the spread of new technologies. People and their ideas move together. Prior to his writings, regional science and population geography did acknowledge the importance of both space and time but tended towards keeping them separate analytically. Hägerstrand's work was overwhelmingly influential in Geography and Regional Science because his work situated people in time and space. Situating people in time and place is at the core of contemporary population geography.

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