Chapter 1
Interaction Data: Definitions, Concepts and Sources

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ABSTRACT

This initial chapter has two aims. Firstly, it seeks to clarify definitional and conceptual issues relating to the key interaction phenomena, migration and commuting, on which the authors concentrate in this book and for which they strive to obtain information to enhance their understanding of the processes that are taking place in the real world. The chapter explains the conceptual distinction between migrants and migrations, the importance of which becomes clear when the difference between transition and movement data is outlined, and it considers the alternative units of migrant measurement that are used such as individuals, wholly moving households and moving groups. Whilst migration tends to be measured over a period of time, typically a year, commuting is an activity that occurs on a much more frequent basis and consequently is usually measured as the numbers making a journey on one day. The chapter indicates how commuting to work and commuting to study are defined and measured. Secondly, the chapter contains the summary of an audit of interaction data sources, outlining the characteristics of the different types of data that are available from censuses, registers and surveys. Particular emphasis is placed on the former, the Census of Population, for which there are a number of data products providing migration and commuting counts at different spatial scales and disaggregated by various attributes; micro data are distinguished from macro data. However, the chapter also introduces a range of other interaction data sources such as the registers of National Health Service patients, the Pupil Level Annual School Census, the databases of the Higher Education Statistics Agency, various national level surveys such as the Labour Force Survey and the International Passenger Survey. In some cases, the data are exemplified using tables or maps. The chapter concludes with a reflection on the importance of the census as a key data source for small area analysis and a plea that, in a post-census world, sufficient steps be taken by central government to ensure the creation and provision of information systems for monitoring

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**INTRODUCTION**

Interaction data refer to counts of flows between geographical origins and destinations. They may be measured by different units and they can be extracted from a range of sources. Whilst flows of commodities, finance, vehicles, telephone calls and email are all typical examples of what constitutes a wide spectrum of flow data, our focus here is on the people whose movement is part of two common geographical phenomena, migration or commuting, whose volumes and patterns are of considerable importance to researchers of human behaviour as well as to planners and policy makers tasked to ensure adequate housing provision and improve traffic congestion.

Different types of interaction data are available from population censuses, administrative registers and social surveys, and we shall explore examples of each of these sources in detail in later sections of the chapter. Some data are cross-sectional whilst other sources provide continuous time series flow statistics useful for sub-national population estimation or projection. Some interaction data are currently available online from internet web sites whilst others are much less accessible, are limited because of disclosure control, or need skilled/experienced staff and extensive effort to ensure accurate extraction or estimation.

In Britain, in the absence of an official population registration system, censuses are accepted as providing the most comprehensive and most reliable migration and commuting data, particularly for flows within and between small areas. Several of the potential non-census interaction data sets originate from administrative sources and involve the collection of records arising from some transaction, or registration, or as a record of service delivery. They are collected for administrative rather than research purposes and many are based in government departments. A selected audit of administrative data sets (Jones and Elias, 2006) shows that most are used to provide stock information, but some include variables that provide information about flows of migrants or commuters such as NHS patients, school pupils, university students, workers and those attending hospital. In some cases, registration data have much simpler structure than census data and are only available at a relatively aggregate spatial scale but are particularly valuable because they are produced on a regular temporal basis. In other cases, the information on migration or commuting has to be generated from the primary unit data using time-consuming data matching and manipulation algorithms.

Surveys are the other main source of interaction data and, in many cases, surveys such as the Labour Force Survey (LFS) or the International Passenger Survey (IPS) provide reasonably detailed data in response to migration questions but are of limited value because their sample sizes allow only restricted spatial coverage. The IPS data on immigrants and emigrants are only published at regional scale and even then, users are advised to smooth out irregularities in the data by calculating three year averages. In most cases, survey data are particularly valuable because of the cross-classification possibilities that are available with primary unit data, even though the geographical dimension may be limited.

This chapter provides a review of the sources of interaction data that exist in the UK together with information about their characteristics, estimation methods, attributes, limitations and availability. Separate sections deal respectively with different census, administrative and survey data sources and we conclude with some reflections on the migration and commuting in an effective way, providing accurate and reliable intelligence on trends and creating opportunities for new research projects that develop explanations.

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