

## FOREWORD

Pursuant to the recommendations of the Population Commission, the Population Division of the United Nations Secretariat has been preparing several manuals describing methods of demographic analysis needed for economic and social policy purposes and suitable for use in many countries, including those where demographic statistics and methods of analysis are not yet adequately developed. Some of those manuals deal with the analysis and evaluation of basic statistics and estimates, and others are concerned with the projection of various population quantities which are needed in diverse fields of economic and social planning. The present Manual, concerned with the analytic study of internal migration, and especially with the use of population census data for such purposes, is part of this longer-range programme.

The following Manuals have been published so far in the series *Manuals on Methods of Estimating Population*; *Manual I: Methods of Estimating Total Population for Current Dates*;<sup>1</sup> *Manual II: Methods of Appraisal of Quality of Basic Data for Population Estimates*;<sup>2</sup> *Manual III: Methods for Population Projections by Sex and Age*;<sup>3</sup> *Manual IV: Methods of Estimating Basic Demographic Measures from Incomplete Data*;<sup>4</sup> *Manual V: Methods of Projecting the Economically Active Population*;<sup>5</sup> and related to the series, *Methods of Analysing Census Data on Economic Activities of the Population*.<sup>6</sup> Also, within the context of this coherent and cumulative programme, two other publications should be mentioned, namely, *Estimating Future School Enrolment in Developing Countries*; a *Manual of Methodology*, published jointly by the United Nations and UNESCO,<sup>7</sup> and the technical report under the title *The Concept of a Stable Population: Application to the Study of Populations of Countries with*

*incomplete Demographic Statistics*,<sup>8</sup> which presents the theoretical background of part of the aforementioned *Manual IV*.

On the occasion of the United Nations World Population Conference, held at Belgrade in 1965, a Committee on Internal Migration was established by the International Union for the Scientific Study of Population (IUSSP),<sup>9</sup> which accepted responsibility for preparing the present Manual. Beginning in 1966, chapters for a first draft were drawn up by Dr. K. C. Zachariah with emphasis on concepts, definitions and sources and the evaluation of various techniques for utilizing census data. This draft was circulated both among members of the Committee and in the United Nations Secretariat for comments and suggestions.<sup>10</sup> A revised version was then prepared by Dr. Zachariah during 1968. Concomitantly, material on population registers was assembled by Dr. S. Kono and Professor D. S. Thomas; and Dr. H. S. Shryock prepared a detailed manuscript on uses of sample survey data. Final editing, including the incorporation of additional material, was accomplished during 1969 by Dr. H. T. Eldridge and Professor Thomas.

In submitting the final draft to the United Nations, the IUSSP Committee on Internal Migration wish to express their appreciation for valuable assistance given them by the staff of the Population Studies Center of the University of Pennsylvania, and especially that provided by Messrs. S. L. N. Rao and K. S. Seetharam, Mesdames A. M. Barbera and L. F. Christaldi, and Miss D. M. Kling.

<sup>1</sup> United Nations publication, Sales No.: 52.XIII.5.

<sup>2</sup> United Nations publication, Sales No.: 56.XIII.2.

<sup>3</sup> United Nations publication, Sales No.: 56.XIII.3.

<sup>4</sup> United Nations publication, Sales No.: 67.XIII.2.

<sup>5</sup> United Nations publication, Sales No.: E.70.XIII.2.

<sup>6</sup> United Nations publication, Sales No.: E.69.XIII.2.

<sup>7</sup> United Nations publication, Sales No.: 66.XIII.3.

<sup>8</sup> United Nations publication, Sales No.: 65.XIII.3.

<sup>9</sup> The Committee consisted of the following members: D. S. Thomas (United States of America), Chairman; J. Arias (Guatemala); R. Bachi (Israel); H. T. Eldridge (United States of America); J. C. Elizaga (Chile); S. Kono (Japan); M. Macura (Yugoslavia); H. S. Shryock (United States of America); T. van den Brink (Netherlands); and K. C. Zachariah (India).

<sup>10</sup> A manuscript on internal migration and population distribution supplied to the United Nations by J. Harewood (Trinidad and Tobago) was also made available to the Committee.



## CONTENTS

	<i>Page</i>
INTRODUCTION . . . . .	1
Basic concepts and definitions . . . . .	1
Migration interval . . . . .	2
Migrant and migration . . . . .	2
Area of origin (departure) . . . . .	2
Area of destination (arrival) . . . . .	2
Migration streams . . . . .	2
Lifetime migrant and lifetime migration . . . . .	2
In-migrant and in-migration . . . . .	3
Out-migrant and out-migration . . . . .	3
Gross and net migration . . . . .	3
Principal sources of data . . . . .	3
Censuses . . . . .	3
Surveys . . . . .	4
Population registers . . . . .	4
 <i>Chapter</i>	
I. CENSUS DATA ON INTERNAL MIGRATION . . . . .	5
Place of birth . . . . .	5
Lifetime migrants . . . . .	5
Estimation of intercensal migration . . . . .	5
Problems of accuracy and adequacy . . . . .	12
Duration of residence . . . . .	14
Migration cohorts . . . . .	15
Problems of accuracy and adequacy . . . . .	16
Cross-classification by place of birth . . . . .	17
Place of last previous residence . . . . .	18
Character of the data . . . . .	18
Advantages and limitations . . . . .	18
Cross-classification by duration of residence . . . . .	18
Place of residence at a fixed prior date . . . . .	19
Type of measure . . . . .	19
Advantages and limitations . . . . .	19
Cross-classification with place of birth . . . . .	22
Summary appraisal of the several approaches . . . . .	23
II. INDIRECT MEASURES OF NET INTERNAL MIGRATION . . . . .	24
Vital Statistics method . . . . .	24
Survival Ratio methods . . . . .	25
Life Table Survival Ratios . . . . .	26
Census Survival Ratios . . . . .	27
Comparison of indirect measures with other measures . . . . .	35
III. MEASUREMENT OF RURAL—URBAN MIGRATION . . . . .	37
Direct measures . . . . .	37
Indirect measures of net migration . . . . .	38
IV. RATES, RATIOS AND OTHER INDICES . . . . .	40
Migration rates and ratios . . . . .	40
Migration streams . . . . .	40
In-migration, out-migration, net migration . . . . .	41
Indirect measures of net migration . . . . .	42

	<i>Page</i>
Specific rates . . . . .	43
Problems of annualizing period rates . . . . .	43
Index of redistribution . . . . .	44
Indices of migration differentials and selectivity . . . . .	45
Some other indices . . . . .	48
Index of preference . . . . .	48
Index of velocity . . . . .	48
Index of net velocity . . . . .	49
Index of effectiveness . . . . .	49

## ANNEXES

I. Uses of continuous population registers in migration analysis . . . . .	50
Introduction . . . . .	50
Problems of definition . . . . .	50
Time series . . . . .	53
Ecological comparisons . . . . .	53
Quality of the data . . . . .	53
Other limitations and other uses . . . . .	56
II. Uses of sample surveys in migration analysis . . . . .	57
Introduction . . . . .	57
Advantages and disadvantages . . . . .	57
Advantages . . . . .	57
Disadvantages . . . . .	58
Quality of the statistics . . . . .	58
Sampling error . . . . .	58
Non-response and other sources of error . . . . .	58
Types of statistics . . . . .	59
Volumes and rates . . . . .	59
Time series . . . . .	60
Differentials: status at the time of survey . . . . .	60
Differentials: status at the beginning of the period or time of migration . . . . .	60
Reasons for migration . . . . .	61
Possibilities of longitudinal analysis . . . . .	67
Other uses of sample surveys . . . . .	70

## List of tables

1. Population classified by governorate of birth and governorate of enumeration, United Arab Republic, 1960 . . . . .	6
2. Lifetime in-migrants by governorate of origin, out-migrants by governorate of destination and net lifetime streams of migration, Cairo governorate, 1960 . . . . .	7
3. Estimate of net migration from birth-place data, selected states in the Indian sub-continent, 1921-1931: procedure 1 . . . . .	8
4. Over-all survival ratios of native white males by geographic division of birth, United States of America, 1950-1960: procedure 2 . . . . .	9
5. Estimated net migration to New England by geographic division of birth, native white males, 1950-1960: procedure 2 ( <i>continued</i> ) . . . . .	9
6. Native white males born in conterminous United States of America on or before 1 April 1950, and living in conterminous United States of America at the census dates, by age, colour and sex, for geographic divisions of birth, 1950 and 1960: procedure 3 . . . . .	10

	<i>Page</i>
7. Census survival ratios for native white males by division of birth and age, conterminous United States of America 1950-1960: procedure 3 ( <i>continued</i> ) . . . . .	11
8. Native white males born in conterminous United States of America and enumerated in New England in 1950, classified by age and by division of birth: procedure 3 ( <i>continued</i> ) . . . . .	11
9. Expected numbers of native white males for New England, by age and division of birth, conterminous United States of America, 1960: procedure 3 ( <i>continued</i> )	11
10. Native white males born in conterminous United States of America and enumerated in New England in 1960, classified by age and by division of birth: procedure 3 ( <i>continued</i> ) . . . . .	12
11. Net changes due to the migration of native white males, by age and division of birth, for New England, 1950-1960: procedure 3 ( <i>continued</i> ) . . . . .	12
12. Net gains due to exchanges between divisions, native white population 10 years old and over in 1960, geographic divisions of conterminous United States of America, 1950-1960 . . . . .	12
13. Migrants classified by state of enumeration and duration of residence, Peru, 1960 . . . . .	15
14. Percentage distribution of in-migrants by period of migration and type of migration, Yugoslavia, 1961 . . . . .	16
15. Dummy table showing method of estimating out-migration among former in-migrants from duration of residence data for an intercensal interval of 10 years	16
16. Percentage distribution of migration streams by duration of residence, and of duration cohorts by state of origin, Greater Bombay, 1961: both sexes . . . . .	17
17. Migrants, by type of move, type of origin and time of migration, Yugoslavia, 31 March 1961 . . . . .	18
18. Interdivisional migrants in the United States of America for the population 5 years old and over, by division of residence in 1955 and division of enumeration in 1960 . . . . .	20
19. Division of residence in 1960, by division of residence in 1955 and division of birth for the population 5 years old and over, United States of America, 1960	20
20. Lifetime and current migration streams to and from New England and net balances for all pairs of streams . . . . .	22
21. Interdivisional migrants 5 years old and over, by categories of migration, United States of America, 1955-1960 . . . . .	23
22. In-migrants and out-migrants 5 years old and over, by categories of migration, New England, 1955-1960 . . . . .	23
23. Estimates of net migration to Madras City by the Vital Statistics method, 1951-1961 . . . . .	24
24. Illustration of procedures for estimating net intercensal migration by age according to the Forward Life Table Survival Ratio method, male population of Greater Bombay 1941-1951 . . . . .	26
25.A. Male population of Korea, by age and hypothetical regions, 1930 . . . . .	27
25.B. Male population of Korea, by age and hypothetical regions, 1935 . . . . .	28
26. Male population of Korea, by age, 1930 and 1935, and census survival ratio, 1930-1935 . . . . .	28
27. Expected male population of Korea, by age and hypothetical regions, 1935 . . . . .	29
28. Net interregional migration of male population of Korea, by age and hypothetical regions, 1930-1935 . . . . .	29
29. Difference in survival ratios, by age, national expectation of life at birth, and the difference in expectation of life at birth between component areas and the nation	31
30. Correction factors for mortality adjustments of census survival ratios for the male population of Korea, 1930-1935 . . . . .	32

	<i>Page</i>
31. Census survival ratios for the male population of Korea adjusted for mortality differences, by age and hypothetical regions, 1930-1935 . . . . .	32
32. First approximation to estimates of the expected male population of Korea, by age, and hypothetical regions, 1935 . . . . .	33
33. Final estimates of the expected male population of Korea, by age and hypothetical regions, 1935 . . . . .	33
34. Net interregional migration of male population of Korea, by age and hypothetical regions, 1930-1935 . . . . .	34
35. Lifetime migrants by rural-urban character of place of birth and place of residence, India, 1961 . . . . .	37
36. Migrants, by place of residence in 1955 and 1961, Greece . . . . .	37
37. Procedure for estimating net rural-urban migration, 1951-1961, for the male population of India, by age, as of 1961 . . . . .	39
38. Illustration of computation of index of redistribution: natives, United States of America, 1940-1950 . . . . .	44
39. Procedure for measuring destination differentials: an example with respect to industry groups, male workers in Greater Bombay, 1961 . . . . .	46
40. Procedure for measuring migration selectivity with respect to age, Japan, 1959-1960 . . . . .	47
41. Destination differentials, by occupational groups, male workers, by educational categories and age, Greater Bombay, 1961 . . . . .	47
42. Comparison of migration, by sex and type, based on the population registers and the census for the one-year period between 1 October 1959 and 1 October 1960, Japan . . . . .	50
43.A. Comparison of in-migration, by prefectures of destination, based on the population registers and the census for the one-year period between 1 October 1959 and 1 October 1960, Japan . . . . .	51
43.B. Comparison of out-migration, by prefectures of origin, based on the population registers and the census for the one-year period between 1 October 1959 and 1 October 1960, Japan . . . . .	51
44.A. In-migrants to Utrecht City, by province of origin, family status and sex, 1963 . . . . .	54
44.B. Out-migrants from Utrecht City, by province of destination, family status and sex, 1963 . . . . .	55
45. Standard errors of estimated numbers, United States Current Population Survey . . . . .	58
46. Standard errors of estimated percentages, United States Current Population Survey . . . . .	58
47. Percentage distribution of persons 1 year old and over in the United States of America, by mobility status: 1950 census and March 1950 Current Population Survey . . . . .	59
48. Age of the population 1 year old and over, by mobility status, for the United States of America, March 1967 . . . . .	59
49.A. Years of school completed by the male population 25 years old and over, by mobility status and age for the United States of America, March 1967 . . . . .	61
49.B. Years of school completed by the female population 25 years old and over, by mobility status and age for the United States of America, March 1967 . . . . .	62
50. Migration rates, by labour force status in March 1962, males 18 to 64 years old, by age for the United States of America, March 1963 . . . . .	62
51. Males 17-64, by labour force status, October 1964, distributed by labour force status, Canada, October 1965 . . . . .	63
52. Male in-migrants to Greater Santiago, by size of place, labour force status, and broad occupation group at origin, 1962 . . . . .	64

	<i>Page</i>
53.A. Male movers 18 to 64 years old, by reason for move and type of mobility, of the United States of America, March 1963 . . . . .	65
53.B. Male movers 18 to 64 years old, by reason for move and type of mobility, of the United States of America, March 1963; percentage distribution . . . . .	65
54. Reasons for moving, by work status and selected occupations . . . . .	66
55. Reasons for job mobility and migration of workers leaving industrial enterprises in Krasnoyarsk, USSR, 1960 . . . . .	66
56. Percentage distribution of unaccompanied and accompanied migrants, by reason for migration and sex, for Seoul, Korea, 1961-1966 . . . . .	67
57. Available migration rates for selected male cohorts, for the United States of America, 1950/51 to 1965/66 . . . . .	69
58. Indices of dissimilarity comparing size-of-place distribution of each cohort at each age with distribution at preceding age . . . . .	71
59. Cumulative mobility of family heads . . . . .	72

---

**List of figures**

I. Gross and net internal migration in the Netherlands, per 1,000 of the population as of 1 January of each year, 1880-1960 . . . . .	52
II. Migration losses of rural areas to towns, Sweden, 1895-1950 . . . . .	53
III. Movers by type of mobility as percentage of the population 1 year old and over, for the United States of America, April 1948-March 1968 . . . . .	60
IV. Selected mobility rates by age and sex, United States of America, 1947/48 to 1957/58 . . . . .	63
V. Lifetime migration histories of the people of the United States of America . . . . .	70
VI. Duration of residence in current place; percentage with specified years or longer, by age, United States of America, 1958 . . . . .	71

---

**List of maps**

1. Net lifetime migration streams across state and provincial boundaries, India, 1931 . . . . .	7
2. Net streams between divisions, native whites 10 years old and over, conterminous United States of America, 1950-1960 . . . . .	13
3. Net streams between divisions, native non-whites 10 years old and over, conterminous United States of America, 1950-1960 . . . . .	14

## *EXPLANATORY NOTE*

The following symbols have been used in the tables throughout the report:

Three dots (...) indicate that data are not available or are not separately reported

A dash (—) indicates that the amount is nil or negligible

A blank in a table indicates that the item is not applicable

A minus sign (−) indicates a deficit or decrease, except as indicated

A full stop (.) is used to indicate decimals

A comma (,) is used to distinguish thousands and millions

A slash (/) indicates a crop year or financial year, e.g., 1960/61.

Use of a hyphen (-) between dates representing years, e.g., 1961-1963, signifies the full period involved, including the beginning and end years.

The term "billion" signifies a thousand million.

Reference to "dollars" indicates United States dollars, unless otherwise stated.