

# 18. A POPULATION LABORATORY IN SENEGAL \*

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The Demographic Section of ORSTOM (Office de la Recherche Scientifique et Technique Outre-Mer) has studied two groups of villages in Senegal by means of the methods outlined below. This study has a double aim :

- a) to obtain a long series of observations which will make it possible to estimate the importance of annual fluctuations in fertility, mortality and migration, to trace different cohorts and to determine the intervals between successive vital events, and
- b) to test a method of analysis which will permit the major part of the data to be used for longitudinal studies.

## I. COLLECTION OF DATA

a) Study Areas. These consist of two groups of villages. The first in the district of Niakhar contains eight villages with 4,500 inhabitants on January 1, 1966; the second in the district of Paos Koto contains 29 villages with 4,050 inhabitants at the same date. These village groups are sub-populations of the Sine Saloum study area, in which 55,000 persons have been studied for a period of three years <sup>1</sup>.

<sup>1</sup> P. Cantrelle, "Etude démographique dans la région du Sine Saloum (Sénégal). Etat civil et observation démographique" ORSTOM, 1969 Travaux et documents No. 1, Paris pp. 121

\* Translated from French.

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FIGURE 1

SAMPLE INDIVIDUAL CARD

Name : **DIAGNE**

		2	4	3	6
		7	2	2	8

 Reference number  
 Given Name : **Samba** Maternal reference number  
 Date and Place of Birth : **1928 N'GHONINE**  
 Father's Name : **Wagne DIAGNE** Ethnic Group :  
 Mother's Name : **Dibor THIAW** **SERER**

Address	
Local District : <b>Niakhar</b>	Sector :
Concession Number : <b>13</b>	
Village : <b>N'Ghonine</b>	Head of Family : <b>Samba DIAGNE</b>

Address	
Local District : <b>Niakhar</b>	Sector : <b>Toucar</b>
Concession Number : <b>17</b>	
Village : <b>Lambarem</b>	Head of Family : <b>Kora DOG</b>

Marriage	Name, Given Name	R.N. of Spouse				Resident, Divorced, Died	
	<b>Dabar SARR</b>			<b>2</b>	<b>4</b>	<b>3</b>	<b>7</b>
<b>Tening DIONE</b>			<b>2</b>	<b>4</b>	<b>6</b>	<b>3</b>	<b>Res</b>

SAMPLE EVENT CARD

Date of Visit	P/A <sup>1</sup>	B D I E <sup>2</sup>	Marital Status <sup>3</sup>	Date	Place	C R <sup>4</sup>		
<b>28/1/64</b>	<b>P</b>	<b>I</b>	<b>M1</b>	<b>7.63</b>	<b>Sacoum</b>			
<b>27/2/65</b>	<b>P</b>		<b>M1</b>					
<b>28/3/66</b>	<b>P</b>		<b>M2</b>	<b>11.65</b>				
<b>15/4/67</b>	<b>P</b>		<b>M2</b>					
<b>17/4/68</b>	<b>P</b>		<b>M2</b>					
<b>13/2/69</b>	<b>P</b>	<b>E/I</b>	<b>M2</b>	<b>4.68</b>	<b>N'GHONINE</b>	<b>kambanem</b>		
<b>17/3/70</b>		<b>D</b>	<b>M2</b>	<b>2.70</b>	<b>Village</b>	<b>fever</b>		

<sup>1</sup> Present, absent; <sup>2</sup> Birth : death : immigration : emigration from the area;  
<sup>3</sup> M1 = married, 1 wife; M2 = married, 2 wives; <sup>4</sup> Cause, remarks

b) Method. This is a multi-round survey with interviews taking place at intervals of one year. The first round took place at the end of 1962; at present therefore there have been eight complete calendar years of observation (1963 - 1970), and it is intended to continue observation in the future. Each village is completely enumerated each year. The questionnaires consist of individual schedules (see figure 1), which contain a complete history of one individual during the whole of the period of observation. On the face of the schedule there are spaces for names and parentage, successive addresses in the study area, and for spouses. On the back different vital events are recorded, at least one line is used for each round (even if no vital event has taken place since the previous round) and several lines, if there has been more than one vital event. When a schedule is full, a continuation sheet is added.

c) The Population and Vital Events recorded. Both the *de facto* and the *de jure* populations are recorded and vital events relating to both these populations are entered on the sheets. The following events are recorded :

- (1) Births and deaths
- (11) Migrations within the study area, as well as moves outside the area
- (111) Changes in the marital situation
- (1V) Weaning and measles

It should be noted that changes of address within the area are frequent; these result from marriages (in a population where the wife takes the husband's domicile) or are linked to kin movements (in a society which is traditional).

In the files each individual is identified by one schedule, however many times he may have changed his address within the study area. It is, however, convenient to leave a dummy sheet for the individual at each address to avoid double counting, for instance, where an individual changed his address within the study area, moved out of the study area, and then returned to his former address.

d) Conduct of the Inquiry. In each village the inquiry begins by bringing the list up to date with the help of the village headman. Then each head of household is asked about the history of people registered during the preceding round, and then about new registrations since this round (births, arrivals). Finally, the list of women is reviewed in order to check that no births have been inadvertently omitted. The annual round of inquiries probably leads to an underestimation both of fertility and infant mortality, as children who were born and died between two successive rounds are liable to be

omitted. This underestimation can be partially corrected by the registration of pregnancies and by subsequent inquiries about their outcomes. The inquiries are made either in the Wolof or the Serer language.

The study is conducted by teams consisting of two enumerators and one supervisor. They are equipped with a light vehicle and a driver. The study period extends over two months in any one year.

A check is made each evening, particular attention being devoted to changes of address, where the old and the new address are "married".

## II. ANALYSIS

The data are analysed on a computer at WHO in Geneva, using a programme specially written for this study at WHO.

### 1. Principles of Analysis

a) The analysis relates to the whole survey and not to each round separately

b) It proceeds by bringing up to date data on population structure at certain given dates, making use of the registration of vital events. Such updating does not erase information on previous situations, and can take place at any time, for example after a new round, using all the data collected during the period of observation.

c) For each individual the information used consists of the characteristics of this individual at the date when he was enrolled into the study, followed by the different vital events which he or she has experienced during the study period, in chronological order.

d) Two levels of information are used : the first is linked to a husband and his wives, the second to a mother and her children.

2. The way in which these basic principles are applied is outlined in the following paragraphs :

a) The population studied is the *de jure* population. Visitors, and events which affect them are not taken into account

b) Each individual in the *de jure* population is given a personal number. This is a simple ordinal number and not a code. Individuals are numbered in order of their appearance on the file. This order is unimportant, the points to note are :

- (i) two different individuals have different personal numbers
- (ii) personal numbers belonging to persons who have died or who have left the study area are not transferred to new births or immigrants into the area.

c) Each individual sheet will contain the personal number of a woman's husband in the case of a married woman, and of the mother in the case of a child.

d) Data relating to an individual are transferred on to two kinds of punched cards : individual cards, one for each person, and event-cards, where none, one or several cards may relate to the same individual, depending on the number of vital events he or she experiences.

e) Individual cards contain data relating to the individual's characteristics at the time when he enters observation. There are therefore three types of such cards, relating respectively to the initial population, to births and to immigrants. They contain "static" data, such as the individual's reference number, his date of entry into the inquiry (date of the initial census, or of birth, or of immigration), his sex and birthplace, his ethnic group, and his maternal clan (in the case of the Serer) and his mother's reference number. In addition, there are variable data, such as address, marital status, husband's reference number (for women), and some health data relating to weaning and measles.

f) Event cards change some of these characteristics. There are six kinds : death, change of address (migration within the area), out-migration from the area, returns after out-migration, changes in marital status (marriage, divorce, widowhood), changes in health status (weaning, vaccination against measles, immunization against measles). The personal characteristics of an individual are not entered on the event card, it contains merely his reference number, followed by information about the event :

in the case of deaths : date, place and cause of death  
change of address : date, new address  
out-migration : date, destination  
return : date, area from which returned  
change of marital status : nature, date, reference number of spouse  
change of health status : nature, date.

g) Checks are made to correct inconsistencies relating to one individual (between sex, date of birth and marital status), and inconsistencies relating to several individuals (difference in age between mother and child, for instance).

3. To show some of the difficulties in this new type of analysis, we discuss how two problems have been treated. If migration and change of marital status occur simultaneously, the marriage is assumed to follow migration. A woman who is an in-migrant to join her husband is noted as single on her initial entry to observation, is given a reference number, and the marriage is registered. If a woman emigrates in order to marry, her marriage is not noted.

The reverse is the case for divorce : a woman who in-migrates after having left her husband, who lives outside the study area, is considered as divorced, and her divorce is not registered; where a woman out-migrates after divorce, the divorce is registered.

Where one of the spouses does not live in the study area, it is possible for a man living within the area to be married to a woman living outside. His initial marital status is given as "married". If he is separated from his wife, who does not appear in the file, the divorce is registered for the man, but not for the woman. To make it possible to use this information, a dummy individual card is created to cover cases of this kind. Similar individual cards are created to cover the situation in the case of women.

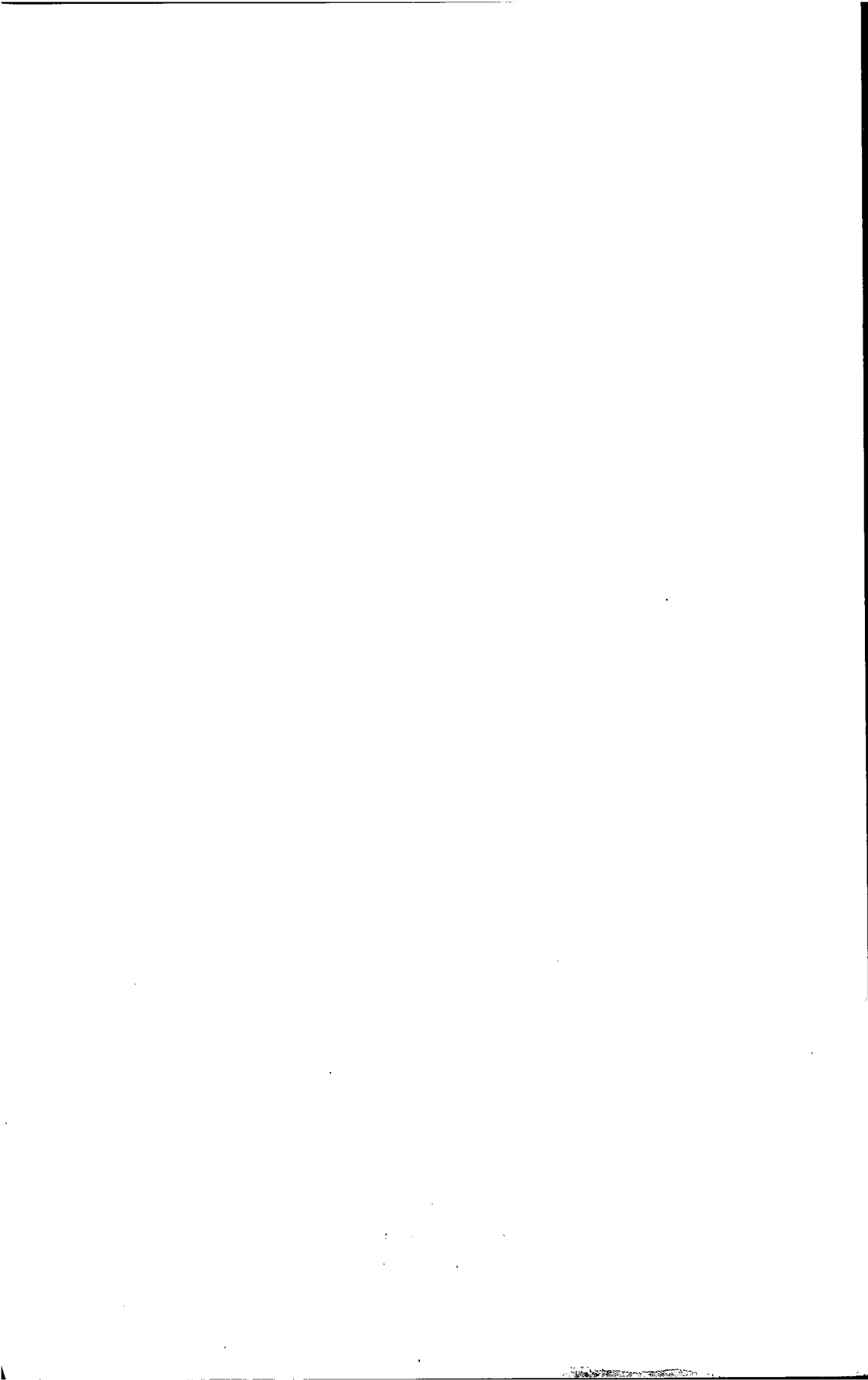
#### 4. Analysis

There are two aspects to the analysis comprising :

a) Period analysis, showing the population at certain dates (1 January, 1963, 1 January, 1967, 1 January, 1971), and a description of the various events registered by year of occurrence.

b) Longitudinal analysis, which is possible for each group of events separately, so that different cohorts may be studied, or for two different kinds of events simultaneously, in order to study the relationship between such events, i.e. the probability that one particular event occurs, after another has already occurred, and the distribution of intervals between such events.

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