A Demographic Analysis of the Senegalese Population of Reproductive Health Care Organizations*

Rachel Sullivan
Departments of Sociology and Demography
University of California, Berkeley
rachsull@demog.berkeley.edu

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Abstract The population of organizations in the reproductive health care field in Senegal serves as the analytical focus of this paper. Adapting the standard tools of demographic analysis, I examine the influence of global and national factors, such as health paradigms and population policies, on the population of organizations in the reproductive health care field in Senegal. As part of a larger project that explores the range of African responses to rapid population growth, the analysis presented in this paper is unique in that it a) informs on overall levels of organizational activity in the population realm in Senegal for the past 30 years, and b) tests the application of demographic techniques to a "nontraditional" population, that of reproductive health care organizations, for whom data are sparse. By combining demographic and sociological methods, this paper shows how understanding the macro causes of the Senegalese organizational population's evolution informs on the overall treatment of population issues in Senegal.

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Introduction

The population of organizations in the reproductive health care field in Senegal serves as the analytical focus of this paper. This population includes any organization that works in Senegal and either provides services related to family planning, reproductive health, of sexually transmitted diseases and HIV/AIDS, studies reproductive health (including academic ventures), socially mobilizes people around reproductive health issues, or provides technical capacity building skills to any of the previously mentioned groups.

This paper is part of a larger project which explores the responses of African countries to rapid population growth, starting with how these growth rates became "problems" in need of attention and solutions. Once deemed an issue, either by a government or an important international lender, primary responses to population growth have included governmental policy and programs, local and foreign organizational activity in the arena of reproductive health and family planning, and other changes at both the individual and institutional levels. The increase in HIV-prevalence in the 1980s followed on the heels of concerns about population growth and induced an organizational response that interwove itself with reproductive health areas. The overlap of reproductive health and HIV/AIDS services resulted both because HIV has primarily been transmitted heterosexually in Africa and because of the influence of the new reproductive health paradigm promulgated by the 1994 United Nations (UN) International Conference on Population and Development (ICPD). Responses to the AIDS epidemic have tended to follow the channels laid by responses to population growth, making a thorough understanding of the factors that influenced the population response important to exploring the responses to the AIDS epidemic.

The data collection and analysis presented below encapsulates the part of the project addressing organizational responses to population growth. In the spirit of organizational ecology, I apply the standard tools of demographic analysis to the reproductive health care population in Senegal since its beginnings in the 1970s. The goal is to understand how this population has been influenced by global and national factors, such as health paradigms and population policies. Specifically, the central question is whether the shape and dynamics of the population of organizations involved in population and AIDS activities can be predicted based on assumptions about external factors that drive organizational births, or whether these trends are best understood in terms of the organizational dynamics of the population.

The paper serves two main purposes. First, knowing how many organizations in Senegal are addressing population and AIDS concerns can help prevent overlap in organizational mission as well as identify areas of need. Though many people involved in the organizational population in Senegal have a feel for such matters, hard numbers are difficult to come by, and overall trends are only anecdotally known. Second, by extending organizational ecology to a unique population consisting largely of nonprofit organizations in a developing country, the analysis serves as a test of the methods which have proved so informative about the behavior of firms in the industrialized countries. Despite its basis in demographic methods and despite the importance of organizations to areas of demographic concern, demographers have tended not to use the tools of organizational ecology or to study organizations in and of themselves.

A Primer on Organizational Ecology

Organizational ecology, a subsection of the sociology of organizations, uses demographic methods to study how industries change based on the organizations that compose them. The general goal of organizational ecology is the measurement of heterogeneity within populations of

organizations in order to analyze its causes and consequences. Organizational ecology should not be confused with organizational demography, which looks at the causes and effects of changes *within* firms, such as turnover, on organizational outcomes (e.g., Haveman and Cohen 1994). The various works of Carroll, Freeman, and Hannan (e.g., Hannan and Freeman 1989, Carroll and Hannan 2000) form the backbone of the subfield of organizational ecology. The discussion below is based on Carroll and Hannan (2000), whose book *The Demography of Corporations and Industries* acts as an excellent introduction to the field. The discussion is meant to provide a sketch of the nature of organizational ecology, not to be a critical review, as well as set the stage for the Senegalese data analyzed later in paper.

Transferring demographic methods, used in the scientific study of *human* populations, to organizational populations is not always straightforward. First of all, what exactly is an organization and what does an organizational population consist of? Organizations are typically ascribed three characteristics: they are 1) corporate actors, 2) mobilized based on purpose, and 3) intended to last (Carroll and Hannan 2000: 77). In other words, they are groups of people with a specific goal or goals who wish to continue to pursue that goal beyond one moment of collective action. This last criterion separates an organization from a demonstration or meeting. A group of organizations within a particular boundary makes an organizational population, or "the set of organizations characterized by a particular organizational form and dependent on a common set of materials and social resources" (ibid.: 65). Organizations, like people, come in different forms, however the differences between the organizational forms in a given population are extreme enough to be make them different units of analysis, a problem that simply does not arise when studying humans.

A second issue inherent in transferring demographic methods from people to organizations is that we desire a means through which to describe the births, migrations, unions, and deaths of organizations. Table 1 provides the organizational correlates of human events, which transfer quite well, but which pose problems when we think about calculating rates of organizational events. Demography uses a particular theory to calculate rates, which is quite meaningful in the case of humans, but not so clearly so in the case of organizations. The denominator of a rate for a given year includes the group of people at risk of an event in that year, and the numerator includes the number of people who experienced the event in that year. So, for example, the age-specific fertility rate for women aged x to $x+n$ in year t includes in the denominator those women aged x to $x+n$ in year t (those at risk for a birth), and the numerator includes the number of births to women of that age in that same year (the event). In other words, the people in the denominator produce the events in the numerator. Organizational maternity cannot, however, usually be ascribed to another organization, meaning that the population treated as at risk for experiencing the birth an organization, the population of existing organizations (Carroll and Hannan 2000: 49), will not actually "produce" that new organization.

Organizational ecologists posit a form of demographic transition within organizational populations analogous to that of human populations, which is called the density dependence hypothesis and is strongly based on an evolutionary theory of organization survival. Unlike in human populations, where the demographic transition describes a shift in high birth and death rates to low birth and death rates, the density dependence hypothesis posits a curvilinear relationship between population size (density) and birth and death rates. Carroll and Hannan (2000:230) argue that density dependence is a property of organizational populations, regardless of variation in organization size, industry size, and temporal factors. Specifically, density

dependence implies that birth rate increases as density first increases, and then falls after a particular density is achieved. Similarly, the theory states that as density first increases, mortality rates decrease. When a particular density is reached, they begin to increase. The relationship between density in and birth rates thus has an upside-down U-shape, and the relationship between density and death rates has a right-side-up U-shape.

Carroll and Hannan (2000) use legitimacy in the Meyer and Rowan (1977) sense of "taken-for-grantedness" to explain density dependence. In terms of birth rates, when an industry is new, legitimacy (either for organizational form or mission) is low due to high uncertainty and the birth rate for new organizations is low. As legitimacy increases, the birth rate increases because the industry has become more attractive. Eventually, however, density increases to the point where competition becomes fierce enough to dampen the birth rate. In terms of death rates, they are high when an industry is founded because of a lack of legitimacy for organizational form or mission. As legitimacy increases, death rates decrease, up until a point when competition reaches a strong enough level to begin to increase death rates.

Common sources for organizational data include industry directories, encyclopedic compilations, governmental registries, organizational censuses (of businesses and industries), restricted-inclusion databases (like patent registries), proprietary datasets, survey data of individuals involved in organizations, and lists of prominent firms from places like *Forbes* or *Fortune* (Carroll and Hannan 2000: Chapter 8). Many of these sources are geared towards profit-making firms, and much of the data used by organizational ecologists was collected by others, often historians, leaving the ecologists to the task of data analysis. Much of the research in organizational ecology is driven by which data are available, explaining the extensive use of the automobile industry (e.g., Carroll and Hannan 1995), telephone companies (e.g., Barnett and

Carroll 1993), newspapers (e.g., Delacroix and Carroll 1983), and even beer-brewing firms (Carroll and Swaminathan 1991). Industries for which data are more limited, such as the non-profit, are less studied.

In addition to the difficulties associated with treating organizations as if they were people, many of the standard social science quandaries influence organizational ecology. Specifically, the tradeoffs between breadth and detail in data plague ecological analyses. The researcher must choose between a sample of organizational types, collecting minimal data on each one, and a detailed census of the organizations in one population, which may or may not be representative of any other population. Carroll and Hannan (2000) argue strongly against attempting to build samples of all organizational types, largely because of the need for detailed data on vital events and other independent variables of interest in organizational ecology. The goal of data collection thus becomes complete event-histories for all organizations within a population whose boundaries are set meaningfully by the researcher.

Once the organizational data are collected, hazard analysis, a method familiar to all demographers, is typically used to estimate a survivor function from the available data (Carroll and Hannan 2000). The ultimate goal is then to predict patterns in hazards of birth and death (and other desired demographic events) based on independent variables that measure either organization-specific factors, or environmental factors of interest.

The data analysis presented below will use the tools and measures of organizational ecology to evaluate the Senegalese population of reproductive health care organizations. It will also use these data to test the density dependence hypothesis.

Defining the Reproductive Health Care Population

The population of interest for this paper includes organizations involved in population and AIDS activities, which are defined as:

1. family planning services,
2. reproductive health care services,
3. STD and HIV/AIDS activities (including prevention, care/treatment, and support/social mitigation, though not orphan-related activities), and
4. collection and analysis of data related to population issues (including development, programs, and policy)[1].

The population consists of organizations with a variety of forms, including non-governmental, multilateral, and bilateral organizations. The population also contains associations that do not have official NGO-status with a government, as well as non-profit organizations that do not call themselves NGOs. Despite the population's organizational diversity, NGOs are a particularly important component, as they provide many of the services and are also influential at the international level, as evidenced by the role they played at the 1994 ICPD (Johnson 1995). There is no standard definition for NGOs. The United Nations (UN) defines an NGO as "any non-profit, voluntary citizens' group which is organized on a local, national or international level" (UN 2004). The popular conception of an NGO is a non-profit organization without governmental ties that participates in altruistic activities that would be supplied by the public sector in a welfare state. NGOs can be either domestic or international, and they remain understudied, despite their growing importance – in 2002, 51% of donor

[1] This definition is based on one used by the Resource Flows Project (http://www.resourceflows.org/index.php/articles/49), which comes from UN definitions from the 1994 International Conference on Population and Development and the 2001 Declaration of Commitment on HIV/AIDS.

expenditures for population assistance to sub-Saharan Africa were channeled through NGOs (UNFPA 2004).

The organizational population of interest also includes multilaterals (e.g., the United Nations and World Bank) and bilaterals development agencies (e.g., the United States Agency for International Development (USAID) and the German Technical Corporation). Notably and purposefully absent are the domestic government sectors involved in the activities of interest. This absence is in order to be able to test the effect of governmental action on the rest of the organizational population. It also facilitates data collection as governmental sub-units are by definition not included in directories of non-governmental organizations.

West Africa is an ideal setting for studying reproductive health care organizations – fertility remains high, with a current total fertility rate of 5.8 (PRB 2004), and thus the region supports multiple different reproductive health care organizations. Senegal in particular has a large reproductive health care organizational population, both because Dakar serves as a regional capital, and because of the country's relatively early (1988) implementation of a national population policy. Because HIV-prevalence remains extremely low, at less than 1% of the adult population in 2003 (PRB 2004), the organizations involved in population activities have not become completely focused on HIV/AIDS, which is predominantly the case in much of southern sub-Saharan Africa. The reasons combined make Senegal an excellent place to examine the population of reproductive health care organizations.

Data Collection

The goal for data collection was deceptively simple: to build a data set of all organizations in the population/AIDS field that had ever existed in Senegal, including their dates of foundation/arrival in Senegal, their mission, their sources of funding, their size, and their date

of dissolution/departure (if applicable). If one were to conduct a similar study on organizations operating in the US, it would be possible to use Internal Revenue Service data for non-profit organizations, or any variety of annually-published directories. With excellent data coverage, it is possible to assume that the first year an organization appears in a directory or tax records is the year of its birth, and that if it disappears from the directories, it has dissolved. Unfortunately, there is no equivalent tactic for studying organizations in the developing world. Thus the data for this paper come from a variety of sources, which are described in detail in an annotated bibliography in Appendix A, and more generally below. The main data sources used to construct the organizational data set for Senegal included:

- Fieldwork conducted in Dakar during July 2004. I initially contacted relevant organizations located through web research, information contained in the scholarly literature, and annual reports and lists of sponsored projects from NGOs, foundations, and bilateral and multilateral organizations. From interviews with representatives of these original organizations, I was able to locate other organizations.
- Print directories of NGOs, development organizations, and women's associations at the country-level. These documents seem to exist in order to provide information to potential donors, and tend to be put together by NGOs or foundations. The main benefit of these directories is that they include many small, local organizations. The main disadvantage is that they are published infrequently and only for the particular types of organizations in which the foundation paying for the directory is interested.
- International organizational directories, which tend to be available both online and in print form. The international directories serve the same purpose as those in print, however they also seem to be targeted towards researchers. Primary examples

include the *Encyclopedia of Associations and International Organizations* (available in print and online as *Associations Unlimited*) and the *Yearbook of International Organizations* (available in print and online). These sources are updated regularly and are easily searchable, however they tend to include only the largest and most well-funded (and thus locatable) organizations. They also tend to privilege breadth of coverage (across countries), rather than depth of coverage for particular countries.

- Senegalese phone books for eight various years between 1973 and 2001. Like US phone books, the Senegalese variant has a yellow pages (categorized by business type) and a white pages section (categorized by business name). The later phone books have sections on international organizations and NGOs, but many of the organizations are not listed either in the yellow or white pages. The phone books are best used for checking whether known organizations existed at particular points in the past, and not for finding organizations in the first place.

Data Set Creation and Cleaning

In order to build the data set, I relied on a total of 30 sources, each of which I classified as either primary and secondary based on the level of organizational information provided. Directories with organization mission information were classified as primary and those without (e.g., phone books) were classified as secondary. This resulted in 17 primary and 13 secondary sources. Inclusion in the data set had to be based on directory membership in order to prevent endless searching for organizations (via the internet, for example) as well as to make the sources of bias more known. To be included in the data set for Senegal, an organization had to be in a primary source and be described in its title, mission, or activities as providing services or doing work (including research) in any of the following areas:

- family planing,
- reproductive health,
- maternal health/mortality,
- sexually transmitted infections,
- HIV/AIDS[2],
- demography, or
- population.

The process of directory search yielded a total of 142 organizations, with foundation dates (or dates of entry into Senegal) from 1930 onwards, and coverage for most organizations through 2004. All organizations had information on type, origin, and mission. I was not able to consistently gather information on size or budget. Because the first Senegalese family planning organization was created in 1974 (Association Sénégalaise pour le Bien-Etre Familial, ASBEF) and the UNFPA first arrived in 1975, I set 1975 as the starting year for the analysis. 32 of the original 142 organizations (mainly from two directories) had only one year of coverage because they were missing foundation dates and were each listed in only one primary directory, so these were cut, leaving 110 organizations.

Figures 1 and 2 (at the back) show the relationship between sources and organizations. Figure 1, the number of organizations per source, indicates that the majority of sources (18) have 10 or fewer organizations in them. However, seven sources contain more than 30 organizations, including one with 73 organizations. To present a feeling for what these directories contain, consider that the United Nations' *Networking: Directory of African NGOs* contained a total of 48 organizations for Senegal in 1999 (44% qualifying for my sample), and 65 organizations in 2003

[2] Not including work related to orphans, because this is only tangentially related to reproductive health. It turned out there were no such AIDS orphan organizations in Senegal.

(43% qualifying for my sample). Figure 2 gives the number of sources that each organization was listed in. Almost 40% of organizations appear in just one or two sources, though about 30% are listed in five or more sources. Luckily, many of those in only one or two sources are in recent sources with good information.

After removing the 32 organizations with only one year of coverage, the data set contained 110 organizations, with 13 missing a date of foundation and 24 whose existence in 2004 was unknown (with an overlap of three organizations). Of the 13 organizations missing an entry/founding date, three were known to have existed in 1973, prior to the starting date for the analysis, so they did not cause concern. Another organization, World Vision International, was known to exist in 1978, so I assumed that it also existed in the years 1975-77. This left nine organizations without founding dates, none of which had been observed before 1995, and all of which were in two or more sources. Because entry into the data set was predicated on directory membership, I originally used information about the founding dates of *other* organizations listed in the same sets of directories to impute founding dates for those organizations originally missing them.

The results of this imputation exercise were, however, somewhat unsatisfactory. In particular, eight of the imputed dates fell between 1980 and 1984, creating their own jump in the graph of organizational entries over time (not shown). Given the availability of other organizational information (type, origin, and mission), I decided to use it instead to impute start dates. For five organizations I imputed start dates based on type, origin, and mission, and for the remaining four, I imputed start dates based on type and origin (there were not enough organizations with the same missions to use this information as well). The imputed dates calculated using organizational information are much more evenly distributed than those

calculated by directory membership, and their inclusion does not change the shape of the graph of the cumulative number of organizations over time (see Figure 3). All discussions below are thus based on the data set containing imputed start dates.

Of the 24 organizations whose existence in 2004 was unknown, I decided to assume existence in 2004 if 1) an organization was known to exist in 2003 (nine organizations), or 2) an organization was listed in 1999 or later and was listed in at least two sources (four organizations). The only effect of assuming an organization's existence beyond the last directory-entry is to increase the numerator for calculations for that given year. Putting these assumptions in place left 11 organizations whose fate in 2004 was unknown and for whom observations were censored at last-observed directory membership.

Data Evaluation

Carroll and Hannan (2000) suggest evaluating censuses of organizations in terms of: 1) organizational coverage, 2) temporal coverage, 3) precision of timing information, and 4) accuracy of organization-specific information (p. 164). For the Senegal data, I believe the organizational coverage to be very good – I found more organizations than I had expected, in a wide variety of areas. In order to prevent endless searching, however, organizations not in any directory had to be excluded. Thus there are approximately 25 organizations that I know exist or existed at some point (from reading reports on population activities in Senegal, as well as from fieldwork), but which could not be included because they never appeared in a directory.

Temporal coverage of these organizations is also quite good, as the history of population-related organizations in Senegal is not long enough for many organizations to fall between the cracks – there are only about 30 years that need to be accounted for. The precision of timing information is also fine – most directories are published soon after the data are collected, and

most of the dates of founding are from organizational self-report. I believe the organization-specific data on mission is reliable and complete, as organizational expression of mission is key to non-profit organizations finding both donors and clients. The one main piece of organization information missing is some measurement of size, whether it is employees, members, clients served, or annual budget. Most organizations simply do not publish this information, and for those that do, it was often available at only one point in time. Given that there is no standard to compare the data set to, one good test of its coverage would be to show it to the people who work for the organizations in question in Senegal. Even then, however, it would still be difficult to know whether the organizations that existed in the past but that have since dissolved have been adequately captured.

The main drawback of the data set is that it does not provide information on organizational death. Because there is no consistent series of directories for the organizations in question, it is impossible to ascertain whether an organizational absence in a directory is due to death, or to the oversight of the people putting the directory together, or to the fact that the organization falls into a different category than that of the available directories. While many directories appear to have done an admirable job finding small organizations, different directories did not list the *same* small organizations. The absences of observed deaths may also be indicative of the fact that the population is young and there simply have not been many endings to observe, creating a right-censoring situation for mortality. For organizational births, however, the data set is fine.

Biases may also have been introduced via the reliance on directories as the primary source of information. Though the biases of the directories can become the biases of the data set, I tried to control for this by using as many types of directories as possible. It is even difficult to

assess the biases of directories. Many directories contain little to no information about their inclusion criteria, and while they may state that any organization that has been included "exists," it is unclear how well they can know this given the relative absence of organizational web sites and the unreliability of email communication. Similarly, it seems to be in the interest of these directories to show how "big" they are – prefaces often have statements about the strength and size of civil society – suggesting that there would be limited concern to identify organizations that no longer existed. Finally, different editions of the same directory will often have exactly the same entries for organizations, right down to the exemplary projects. While this is undoubtedly a time-saving measure, it is not reassuring as an indicator that organizations have been recontacted, and makes it difficult to determine when organizations began offering new and/or different services.

Analysis

Table 2 (at back) gives basic information on the organizations contained in the data set. Organizations were categorized into four types (as described earlier): NGO/non-profit, bilateral, multilateral, and other. The "other" category includes organizations with the classification of "association" as well as organizations devoted to research but who were not classified as NGOs. From Table 2 we can see that the vast majority of organizations (74%) are NGOs or non-profits, though this figure is most likely an underestimate, as the majority of the "other" category consists of organizations who are probably non-profit as well. The high percentage of NGOs is reflective of the predominance of this organizational form in developing countries.

Table 2 also shows organizations' origin: domestic (from Senegal), regional (from somewhere in Africa), or international (from outside Africa). The majority of organizations (65%) are Senegalese, indicating that Senegalese civil society is thriving. Almost two thirds of

the data set consists of organizations whose primary mission is population (29%) or development (31%). The remainder of the organizations are divided fairly evenly between children/youth, health, umbrella organizations (which were impossible to classify under any of the other headings), women, and a set of other missions classified together as miscellaneous (including the environment, education, and professional associations.)

The 32 organizations whose primary mission is population are of particular interest. As we can see from Table 3, they look basically the same as the overall data set in terms of their type (NGO, bilateral, etc.) and origin. 44% list HIV/AIDS (which usually includes focus on other sexually transmitted infections) as their primary activity, and another 39% are involved in either family planning or reproductive health (which, though different terms, seem to mean close to the same activities on the ground). The classification "Population" refers to organizations involved in lobbying, research, and awareness activities. The number of organizations whose activities are devoted primarily to HIV/AIDS is somewhat high, given the low level of HIV-prevalence in Senegal (less than 1% of the adult population (PRB 2004)). Optimistically, one could argue that these organizations have kept the prevalence-rate low, though there are undoubtedly other factors at play. Figure 4 tells the story of how population organizations' missions changed over time. Each bar represents the number of organizations founded during a five-year period, divided into groups by the organization's primary mission. We see that the early foundings are tipped towards family planning and reproductive health, whereas the later foundings are more likely to be in HIV/AIDS. This reflects a larger trend in funding for population activities – between 1995 and 2002, the percentage of total donor expenditures for population activities (for the whole world) directed towards HIV/AIDS increased from 9 to 43%

(UNFPA 2004). Again, given the low prevalence of HIV/AIDS in Senegal, the number of HIV/AIDS entries suggests the influence of external funding on local activities.

This final section of the analysis use some of organizational sociologists' standard measures to evaluate hypotheses about the causes organizational births and compares these findings to the density dependence hypothesis. Most basically, I take a functional perspective that organizations come into existence when there is a need or demand for them. This suggests that we would observe an increase in organizational births after the following dates:

- 1980 – repeal of 1920 law forbidding sale of contraceptives (Wilson 1998)
- 1986 – the discovery of the first AIDS cases in Senegal (JICA 1999)
- 1988 – the announcement of Senegal's first population policy (Wilson 1998)
- 1994 – UN ICPD in Cairo
- 1999 – Restructuring of government health system to include a reproductive health division (Laty Ndoye, personal communication)

Although causality will be impossible to determine, correlations in timing will be meaningful. These events did have rapid organizational outcomes: USAID began funding HIV/AIDS in 1987 (USAID HIV/AIDS web site), and the UN helped to create networks of parliamentarians, journalists, and youth (among others) to promote population activities soon after the 1994 ICPD. One such network, the Réseau des Parlementaires pour la Population et le Développement (Network of Parliamentarians on Population and Development), was created in 1995. We would also expect for there to be a relationship between Senegal's population growth rate and organizational activities – organizations involved in population activities should be better able to leverage funding when they can point to high growth rates as justification for their activities.

To test these hypotheses, I look at the number of new organizations per year, both as raw counts as well as divided by the population of existing organizations (which the organizational sociologists refer to as a hazard rate, but which is in reality a crude birth rate). I also show the cumulative count of organizations over time, the density (population size) of organizations over time, as well as a plot of the density by the crude birth rate.

Figure 5, the graph of raw counts of organizational births by time shows strong peaks in 1989 and 1993. We would expect the peak in 1989, given the announcement of the Senegalese population policy the year before, as well as the rising awareness of AIDS. The peak in 1993 is more difficult to explain via functional causes, though one could potentially argue that the forces that lead to the focus of the 1994 ICPD on reproductive health were already in play and influencing organizational action.

When we look at the graph of crude birth rates for organizations (Figure 6), we see the two highest rates in 1989 and 1993, which agrees with the analysis of raw counts, as well as peaks in 1975, 1982, 1984, and 1987. The peak in 1975 is the "beginning" of the population, and the ones in 1982 and 1984 could be interpreted as lagged effects of the repeal of the law banning the sale of contraception. 1987 fits with the beginning of USAID's funding for AIDS activities (which are not included in that peak – USAID's history in Senegal goes back to the 1960s), as well as increasing awareness of AIDS. Both Figures 5 and 6 tell a story of an increasing rate of organizational births until sometime in the 1989-93 range, followed by a decreasing birth rate.

Now restricting our view to just those organizations whose primary mission is population (Figures 7 and 8), we see an enormous peak in 1989, and only some smaller peaks thereafter. We see the biggest peak in the crude birth rate in 1989, as well as peaks in 1975 and 1992. In

both graphs it is difficult to characterize the period up to 1989, but from then onwards, the trend in the raw count and birth rate is decidedly downwards. As with the entire population of organizations, the activity around 1988-89 corresponds nicely with governmental actions at that point, as well as increasing concerns about HIV/AIDS.

Finally we turn to testing the density dependence hypothesis, which states that up until a certain point, as density increases, so should the crude birth rate of organizations. Figure 9 shows the density of the whole data set, as well as that of the sub-sample of organizations whose primary mission is population, over time. From this we can see that density leveled out around 1999 for the whole data set, and a few years earlier for the sub-sample. This alone suggests that the market for such organizations has been saturated. The density dependence hypothesis posits an inverted U-shape to the curve of density by organizational birth rate. Figure 10 shows a scatter plot (whose points have been connected with smoothed lines) of density versus the crude birth rate. It is difficult to say whether the data support the density dependence hypothesis – on the one hand, the curve is quite bumpy. On the other hand, if the valleys are ignored, and only the peaks considered, the shape is roughly an inverted-U. The density dependence hypothesis allows for the inverted-U shape even as density continues to increase, which does not appear to be the case with the Senegalese population. Overall, it seems safe to say that the data weakly confirm the density dependence hypothesis.

Conclusion

The data set I gathered and which is presented in this paper gives a more complete picture of organizations involved in population activities in Senegal than has been presented elsewhere. It shows a population characterized by Senegalese non-profits which has experienced few deaths and whose growth has slackened only in the past 10-15 years. This information should be of use

to policy-makers, as well as these organizations themselves as they decide how to solicit and allocate funds. The collection and analysis of the Senegalese data set indicates that this method is a useful, if time-consuming, way in which to study organizational response to rapid population growth. The burst of organizational activity at the end of the 1980s appear to conform to hypotheses about what drives organizational birth, in this case the appearance of HIV/AIDS in Senegal (and the associated funding by large donor agencies such as USAID) and the announcement of the first government population policy. The analysis also provides some support for the density dependence hypothesis of organizational sociology.

There are two main ways to extend the analysis presented in this paper. One is to determine the effect of organizational behavior on environmental factors, particularly governmental population policies, but also on fertility levels. The second is to compare Senegal's response to that of other countries, specifically in West Africa. It may be that Senegal provides an organization-friendly environment which has spurred more activity than in other countries. A comparison with other countries would be particularly useful to determine whether organizational trends in Senegal are actually reflective of the Senegalese environment, or whether the correlation is spurious and the trends instead result from changes in the international funding arena.

Overall the paper shows that analysis of the organizational component of a country's response to rapid population growth provides valuable insights. These findings indicate that continued effort should be put towards the collection of organizational data, particularly in the realm of population activities. In the case of Senegal, there is strong support for the correlation between environmental factors and organizational births. Patterns in organizational demographic events in Senegal also reflect trends outside the country's borders, particularly the increase in

worldwide prevalence of HIV/AIDS and the resultant shifts in international funding. While these changes in funding levels may be warranted overall, knowing what is happening in Senegal increases the odds that adjustments can be made to existing organizational missions to that they continue to meet the needs of Senegalese people.

Appendix A: Annotated Bibliography of Data Sources for Senegalese Organizations

Africa Consultants International. 1999. *Répertoire des Organizations Intervenant dans la Santé de la Reproduction des Adolescents au Senegal*. Dakar, Senegal : Africa Counsultants International.

This directory provides information on organizations involved in adolescent reproductive health in Senegal. It contains an alphabetical listing of organizations, including contact information, activities, target groups, types of assistance provided, geographical areas served, and materials provided (if any). There are indices that list the organizations by region and activities, as well as a list of resources (books, videos, and pamphlets) published by organizations in the directory. Though the level of organizational information is high, though unless organizations chose to list their founding date, funding sources, or staff numbers, the information is not available. ACI is an American NGO located in Dakar (http://www.acibaobab.org/). The typesetting is the same as the ALIN directory. [In French, with some organizational descriptions in English.]

Arid Lands Information Network. 1995. *Community Guide to HIV/AIDS Resources*. Dakar, Senegal: Arid Lands Information Network.

The directory from the Arid Lands Information Network (ALIN) provides information on HIV/AIDS resources in Burkina Faso, Chad, Ethiopia, Ghana, Kenya, Mauritania, Mali, Niger, Senegal, Sudan, Tanzania, and Uganda. Financial support was provided by Lutheran World Relief. The guide contains listings of organizations, by country, including contact information, activities, target groups, types of assistance provided, geographical areas served, and materials provided (if any). There are indices that list the organizations by country and activities, as well as a list of resources (books, videos, and pamphlets) published by organizations in the directory. Though the directory gives detailed information on the organizations' activities, it does not include information on founding dates, donors, or staffing, unless specific organizations chose to include that information. The type setting is the same as the ACI directory. ALIN appears to currently exist as an entity in Kenya (http://www.alin.or.ke/). [In English.]

Fondation Friedrich Ebert. 1998. *Les ONG dans l'Environment au Sénégal*. Dakar, Senegal: Fondation Friedrich Ebert.

This directory contains information on environmental organizations operating in Senegal. The information provided for each organization is excellent: contact information, date of creation, agreement number (for the purposes of registry with the Senegalese government), objectives, means of intervention, area of intervention, environmental projects, and other types of interventions. The directory is divided into sections of Senegalese organizations and foreign organizations, and includes an alphabetical index. There are two appendices, one containing the Senegalese government's 1996 decree on NGOs, and another containing contact information for Senegalese government offices dealing with the environment. Fondation Friedrich Ebert is a German foundation with an office in Senegal (http://senegal.fes-international.de/). [In French.]

----------. 1999. *Associations et ONG Féminines au Sénégal*. Dakar, Senegal: Fondation Friedrich Ebert. Available online at http://www.fes.de/fulltext/bueros/senegal/00720toc.htm.

This directory was published with the Senegalese Ministere de la Famille, de l'Action Sociale et de la Solidarité Nationale and contains information on women's organizations

in Senegal. It contains a unique listing of local women's associations for all areas of the country, as well as a listing of national and international NGOs. The information available for each organization is very detailed: contact, target group, date of creation (including government registry number), organizational affiliations, financial resources (for the local associations), mission, areas of intervention, and achievements. There is also an index by organization acronym, and the directory is available online. [In French.]

Gale Research Company. 2004. *Encyclopedia of Associations*. Detroit, MI: Gale Research Company. Available online as Associations Unlimited (restricted subscription.
The *Encyclopedia of Associations* is available in both print and electronic versions. The online version is easy to search, and contains varying degrees of information for organizations. Most entries include contact and a basic description of organizational activities.

Interagency Coalition on AIDS and Development. 2003. *Twinning Directory*. Available online at http://www.icad-cisd.com/content/twinning_search.cfm?lang=e.
The *Twinning Directory* is designed to help organizations find partners, so it has only basic information (contact information, brief description) for organizations. The copyright on the site is 2003.

Sontatel. 1973, 1980, 1985, 1986, 1987, 1989, 1996, and 2001. *Annuaire Officiel des Téléphones de la République du Sénégal*. Dakar, Senegal: Sontatel.
I was able to obtain telephone books for these years from Stanford University's library system (mainly the Hoover Institute). These directories make a somewhat unreliable source as they change format from year to year and do not appear to be used by organizations as a means of making themselves known. Some (but not all) of the later directories are helpfully organized with sections for international organizations and for NGOs. Most organizations discussed in this paper were not listed – the best coverage was for multilaterals, as well as for later years (1996 and 2001). [In French.]

Technical Assistance Information Clearing House. 1971, 1978, and 1983. *US Non-Profit Organizations in Development Assistance Abroad*. New York: American Council of Voluntary Agencies for Foreign Service.
The publications of the Technical Assistance Information Clearing House (TAICH) provide information on American organizations working abroad. The directory appears to have been published at varying intervals from 1956 through 1983. Each directory contains an alphabetical listing of organizations with information on their mission, activities, countries of service, funding, and staff. There are indices by category (of assistance) and country, which list the organizations active in those area. The directories provide detailed information on the organizations themselves, though it can be difficult to tell which activities were enacted in a given country. [In English.]

Union of International Associations. 2004. *The Yearbook of International Organizations*. Brussels: Union of International Associations. Available online (restricted access).
One of the main databases used by organizational sociologists, the *Yearbook* has been published annually for much of the past century. It contains detailed information on each organization, including contacts, date of founding, mission, structure, finance, and a host of affiliations. The online edition is cross-linked and fairly easy to navigate.

United Nations. 1999. *Networking: Directory of African NGOs, First Edition*. New York : United Nations.

----------. 2003. *Networking: Directory of African NGOs, Second Edition*. New York : United Nations. Available online at : http://www.unpan.org/NGO-Africa-Directory/index.htm.
These directories contain detailed information on NGOs operating in Africa in a variety of areas. Information available for each organization includes : contact, type of organization, year founded, affiliations, intervention areas, mission, and example projects. The second directory contains almost all the organizations in the first directory, frequently with the exact same entry. The second edition is available online. [In English and French.]

United Nations, Department of Public Information, NGO Section. 2000, 2001, 2004. *DPI/NGO Conference Attendees*. Available online at http://www.un.org/dpi/ngosection/preconf.htm.
The NGO section of the UN's Department of Public Information holds a conference every year, and lists of attendees are available for some year. Only name and contact information are given – there is nothing about organizational mission.

----------. 2004. *United Nations DPI NGO Directory*. Available online at http://www.un.org/dpi/ngosection/asp/form.asp.
The UN's Department of Public Information, NGO Section, publishes a list of accredited members which can be searched by region, country, and activity. This provides only name and contact information, and appears to cover far fewer organizations than attend the Department's annual conferences.

United States Agency for International Development. 1977. *International Directory of Women's Development Organizations*. Washington, DC: United States Agency for International Development.
This USAID directory contains a listing of organizations by country with contact information, membership, founding date, activities, resources, and achievements. There is a helpful master chart at the beginning of the directory which provides an overview of each organization. There is a list of international organizations (with the same information) at the back of the directory. USAID is the American bilateral development agency. [In English.]

----------. 2002. *Directory of Association of People Living with HIV/AIDS, First Edition*. Washington, DC: United States Agency for International Development. Available online at http://www.synergyaids.com/announce/PDFs_Announcements_Page/hivaidsdirectory.pdf

----------. 2004. *Directory of Association of People Living with HIV/AIDS, Second Edition*. Washington, DC: United States Agency for International Development. Available online at www.usaid.gov/our_work/global_health/ aids/Publications/docs/hivaidsdirectory.pdf.
These directories are organized by country and contain information on organizations providing support to people living with HIV/AIDS. The 2004 editioin is much more detailed and complete than the 2002 edition. For each organization, both directories contain contact information, year of founding, geographic areas targeted, activities, source of financing, number of members, and organizational affiliations. [In English and French.]

Wesselink, Bert. 2005. *The Directory of Development Organizations, Sixth Edition*. Available online at http://www.devdir.org/index.html.

This directory contains brief information on development organizations all over the world. The information available for each organization includes : contact, web page (if available), category (international organizations, government institutions, private sector support organizations (including fairtrade), finance institutions, training and research centres, civil society organizations, development consulting firms (including references to job opportunities and vacancy announcements), information providers (development newsletters/journals), and grantmakers). Directories for individual countries can easily be downloadable in PDF form, and the directory can be searched online. Earlier editions of the directory are not available. Wesselink informed me via email that when updating the directory, all attempts possible are made to contact organizations to determine whether they still exist. [In English.]

World Association of Non-Governmental Organizations. 2003. *Worldwide NGO Directory*. Available online at http://www.wango.org/resources/NGO_directory.htm.
The World Association of Non-Governmental Organizations (WANGO) was created in 2000. Its membership directory is available online and is searchable by region, country, and area of intervention. For each organization, it contains information on : contact, date of founding, mission, areas of intervention, geographic area served,type of organization, and membership. There is no information on when the individual entries date from, so I attributed them the date of the copyright on the web page (2003).

References

Africa Consultants International. 1999. *Répertoire des Organizations Intervenant dans la Santé de la Reproduction des Adolescents au Senegal*. Dakar, Senegal : Africa Counsultants International.

Arid Lands Information Network. 1995. *Community Guide to HIV/AIDS Resources*. Dakar, Senegal: Arid Lands Information Network.

Barnett, William P. and Glenn R. Carroll. 1993. "How Institutional Constraints Affected the Organization of Early US Telephony." *Journal of Law, Economics, and Organization* 9:98-126.

Carroll, Glenn R. and Michael T. Hannan. 2000. *The Demography of Corporations and Industries*. Princeton, NJ: Princeton University Press.

----------. 1995. Pp. 195-214 in *Organizations in Industry: Strategy, Structure, and Selection*, edited by Glenn R. Carroll and Michael T. Hannan. New York: Oxford University Press.

Carroll, Glenn R. and Anand Swaminathan. 1991. "Density Dependent Organizational Evolution in the American Brewing Industry from 1633 to 1988." *Acta Sociologica* 34:155-75.

Delacroix, Jacques and Glenn R. Carroll. 1983. "Organizational Foundings: An Ecological Study of the Newspaper Industries of Argentina and Ireland." *Administrative Sciences Quarterly* 28: 274-91.

Fondation Friedrich Ebert. 1998. *Les ONG dans l'Environment au Sénégal*. Dakar, Senegal: Fondation Friedrich Ebert.

----------. 1999. *Associations et ONG Féminines au Sénégal*. Dakar, Senegal: Fondation Friedrich Ebert. Available online at http://www.fes.de/fulltext/bueros/senegal/00720toc.htm.

Gale Research Company. 2004. *Encyclopedia of Associations*. Detroit, MI: Gale Research Company.

Hannan, Michael T. and John Freeman. 1989. *Organizational Ecology*. Cambridge, MA: Harvard University Press.

Haveman, Heather A. and Lisa E. Cohen. 1994. "The Ecological Dynamics of Careers: The Impact of Organizational Founding, Dissolution, and Merger on Job Mobility." *American Journal of Sociology* 100:104-52.

Interagency Coalition on AIDS and Development. 2003. *Twinning Directory*. Available online at http://www.icad-cisd.com/content/twinning_search.cfm?lang=e.

Japan International Cooperation Agency (JICA). 1999. *Country WID Profile (Senegal)*. JICA Planning Department. Available online at www.jica.go.jp/english/global/wid/report/pdf/e99sen.pdf.

Johnson, Stanley. 1995. *The Politics of Population: Cairo 1994*. London: Earthscan.

Meyer, John W. and Brian Rowan. 1977. "Institutionalized Organizations: Formal Structure as Myth and Ceremony." *American Journal of Sociology* 83(2): 340-363.

Population Reference Bureau (PRB). 2004. *2004 World Population Data Sheet*. Washington, DC: Population Reference Bureau. Available online at http://www.prb.org/pdf04/04WorldDataSheet_Eng.pdf.

Sontatel. 1973, 1980, 1985, 1986, 1987, 1989, 1996, and 2001. *Annuaire Officiel des Téléphones de la République du Sénégal*. Dakar, Senegal: Sontatel.

Technical Assistance Information Clearing House. 1971, 1978, and 1983. *US Non-Profit Organizations in Development Assistance Abroad*. New York: American Council of Voluntary Agencies for Foreign Service.

Union of International Associations. 2004. *The Yearbook of International Organizations*. Brussels: Union of International Associations. Available online (restricted access).

United Nations. 1999. *Networking: Directory of African NGOs, First Edition*. New York : United Nations.

----------. 2003. *Networking: Directory of African NGOs, Second Edition*. New York : United Nations. Available online at : http://www.unpan.org/NGO-Africa-Directory/index.htm.

United Nations, Department of Public Information, NGO Section. 2000, 2001, and 2004a. *DPI/NGO Conference Attendees*. Available online at http://www.un.org/dpi/ngosection/preconf.htm.

----------. 2004b. *United Nations DPI NGO Directory*. Available online at http://www.un.org/dpi/ngosection/asp/form.asp.

----------. 2004c. "NGOs and the Department of Public Information." Available online at http://www.un.org/dpi/ngosection/brochure.htm.

United Nations Population Fund (UNFPA). 2004. *Financial Resource Flows for Population Activities in 2002*. New York: UNFPA.

United States Agency for International Development. 1977. *International Directory of Women's Development Organizations*. Washington, DC: United States Agency for International Development.

----------. 2002. *Directory of Association of People Living with HIV/AIDS, First Edition*. Washington, DC: United States Agency for International Development. Available online at http://www.synergyaids.com/announce/PDFs_Announcements_Page/hivaidsdirectory.pdf

----------. 2004. *Directory of Association of People Living with HIV/AIDS, Second Edition*. Washington, DC: United States Agency for International Development. Available online at www.usaid.gov/our_work/global_health/ aids/Publications/docs/hivaidsdirectory.pdf.

----------. Undated. "USAID/Senegal: Supporting Senegal's fight against HIV/AIDS since 1987." Available online at http://www.usaid sn.org/activities/health/facts_HIV_AIDS.html.

Wesselink, Bert. 2005. *The Directory of Development Organizations, Sixth Edition*. Available online at http://www.devdir.org/index.html.

Wilson, Ellen. 1998. *Reproductive Health Case Study : Senegal*. Futures Group International (POLICY Project). Available online at http://www.policyproject.com/pubs/countryreports/sendbl.pdf.

World Association of Non-Governmental Organizations. 2003. *Worldwide NGO Directory*. Available online at http://www.wango.org/resources/NGO_directory.htm.

Table 1. Organizational Equivalents of Population Events

Population Event	Description
Birth	The establishment of an organization, whether it is the opening of a branch office of a large, international NGO or the formation of a local community-based organization.
Growth	Change in the total number of organizations in the population, which can be either positive or negative.
Union	A partnership, most likely through subcontracting, or (less commonly), an actual merger of two organizations.
Migration	The transfer of an organization across country borders.
Death	Either organizational collapse, or a complete shift in organizational mission.

Table 2. Organizational Characteristics for Total Data Set

Characteristic	Percentage of Total (N = 110)
Type of Organization	
Bilateral	3
Multilateral	5
NGO/Non-Profit	74
Other	18
Origin of Organization	
Domestic	65
International	27
Regional	8
Primary Mission	
Development	30
Population	29
Women	11
Children/Youth	9
Health	7
Umbrella	5
Miscellaneous	8

Table 3. Organizational Characteristics for Population Sub-Sample

Characteristic	Percentage of Total (N =32)
Type of Organization	
Bilateral	0
Multilateral	3
NGO/Non-Profit	72
Other	25
Origin of Organization	
Domestic	66
International	19
Regional	16
Primary Mission	
HIV/AIDS	44
Reproductive Health	25
Family Planning	16
Population	9
Maternal Health	6

Figure 1. Distribution of Organizations per Source

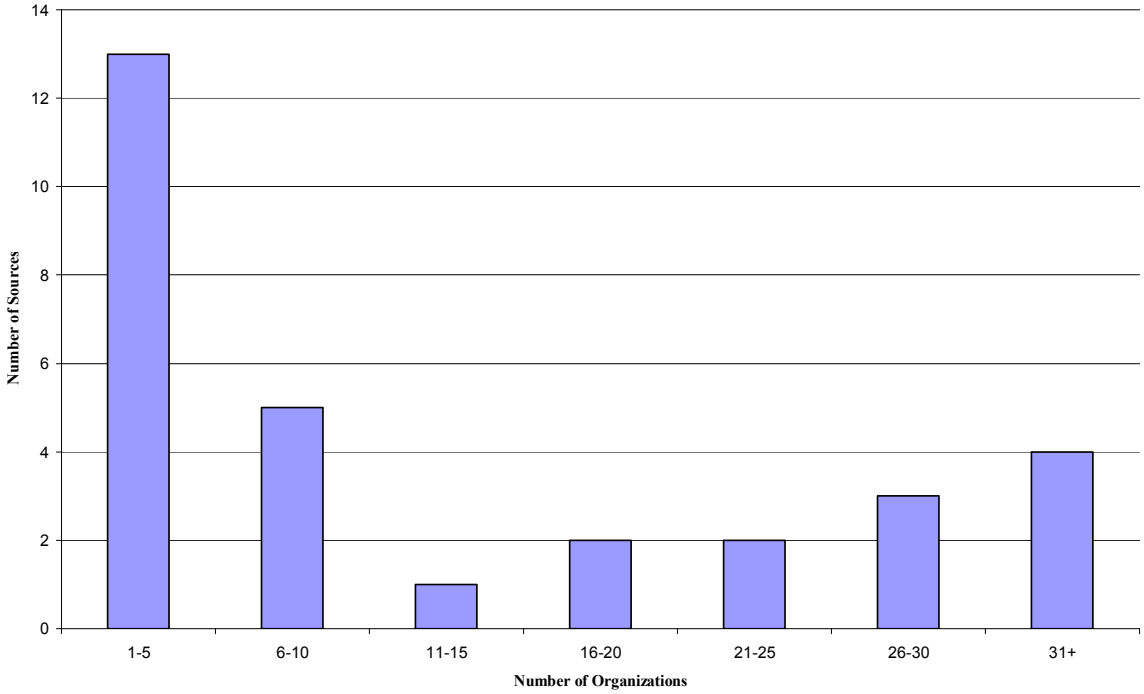

Figure 2. Number of Sources Per Organization

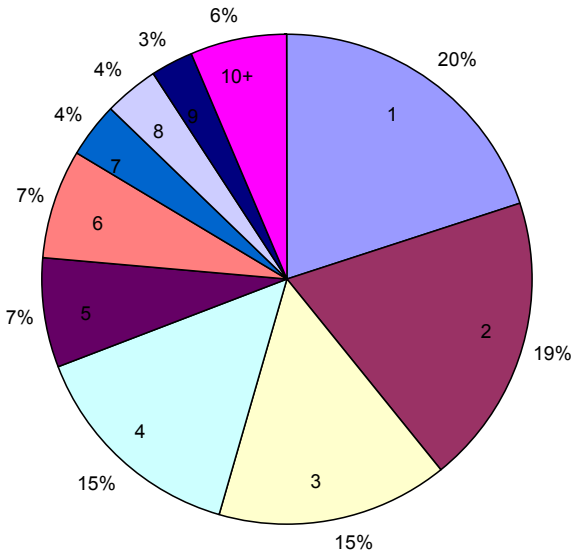

Figure 3. Cumulative Number of Organizations, With and Without Imputed Dates

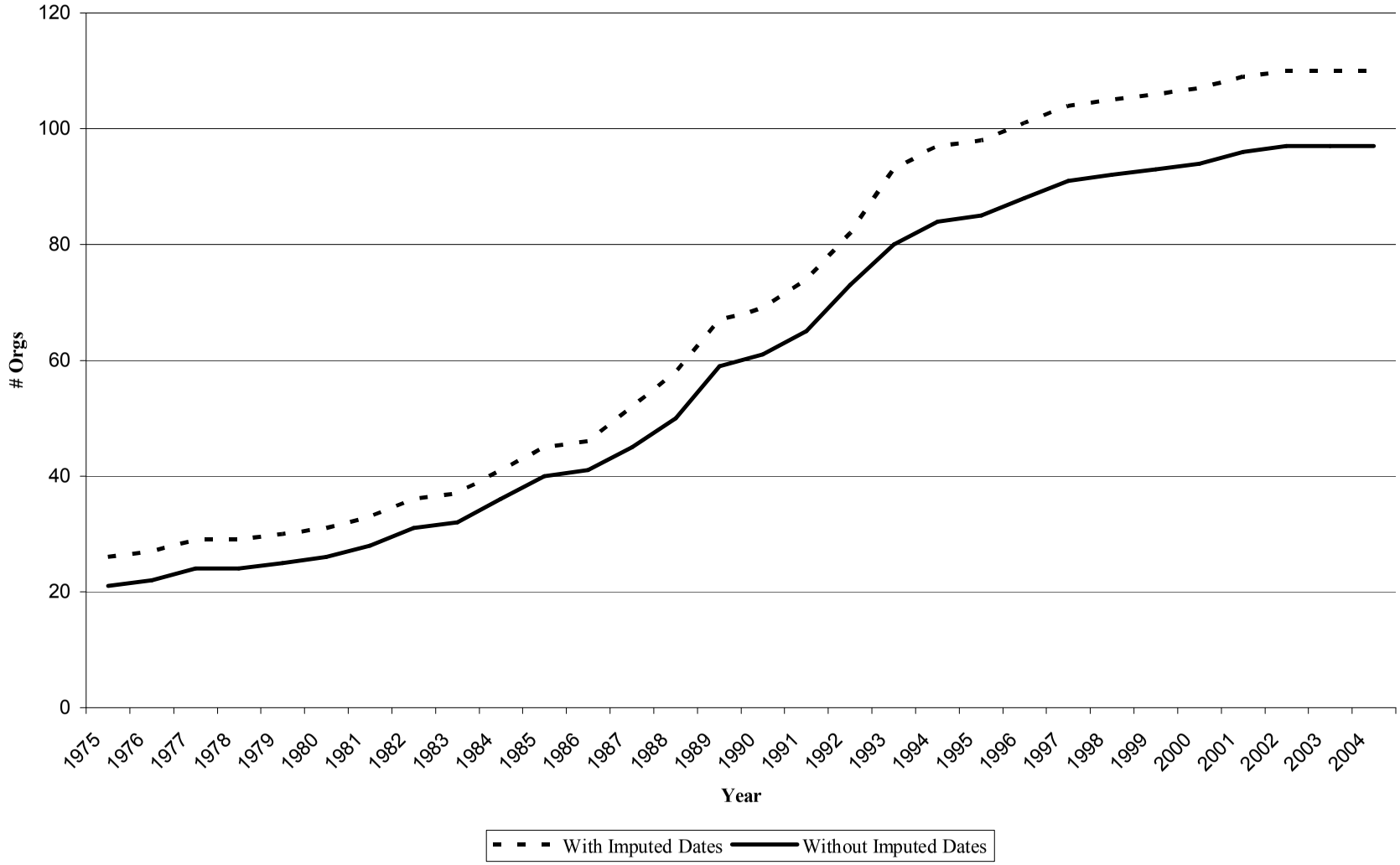

Figure 4. Organizational Founding Dates, by Mission, Population Sub-Sample

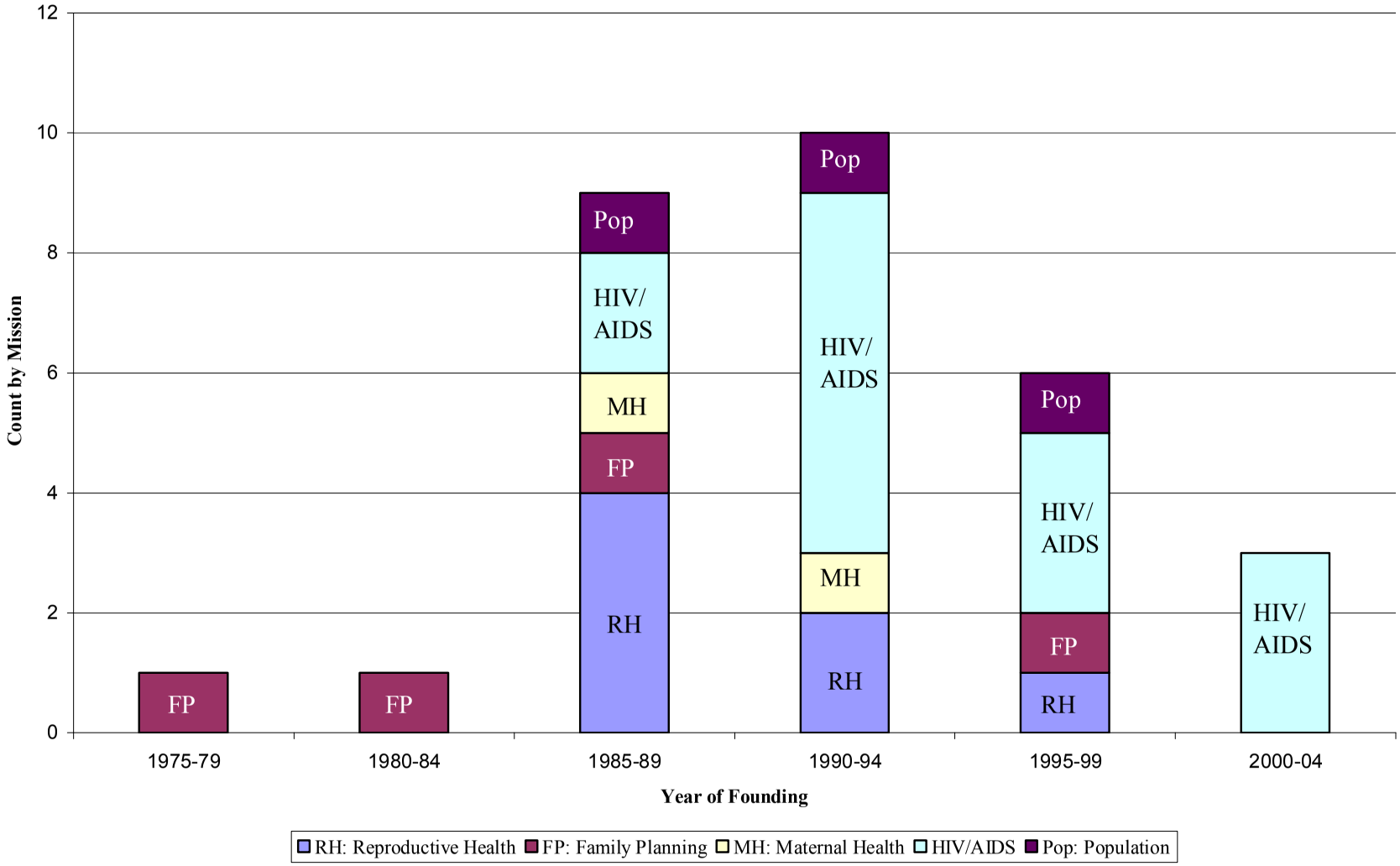

Figure 5. Number of New Organizations Per Year, 1975-2004

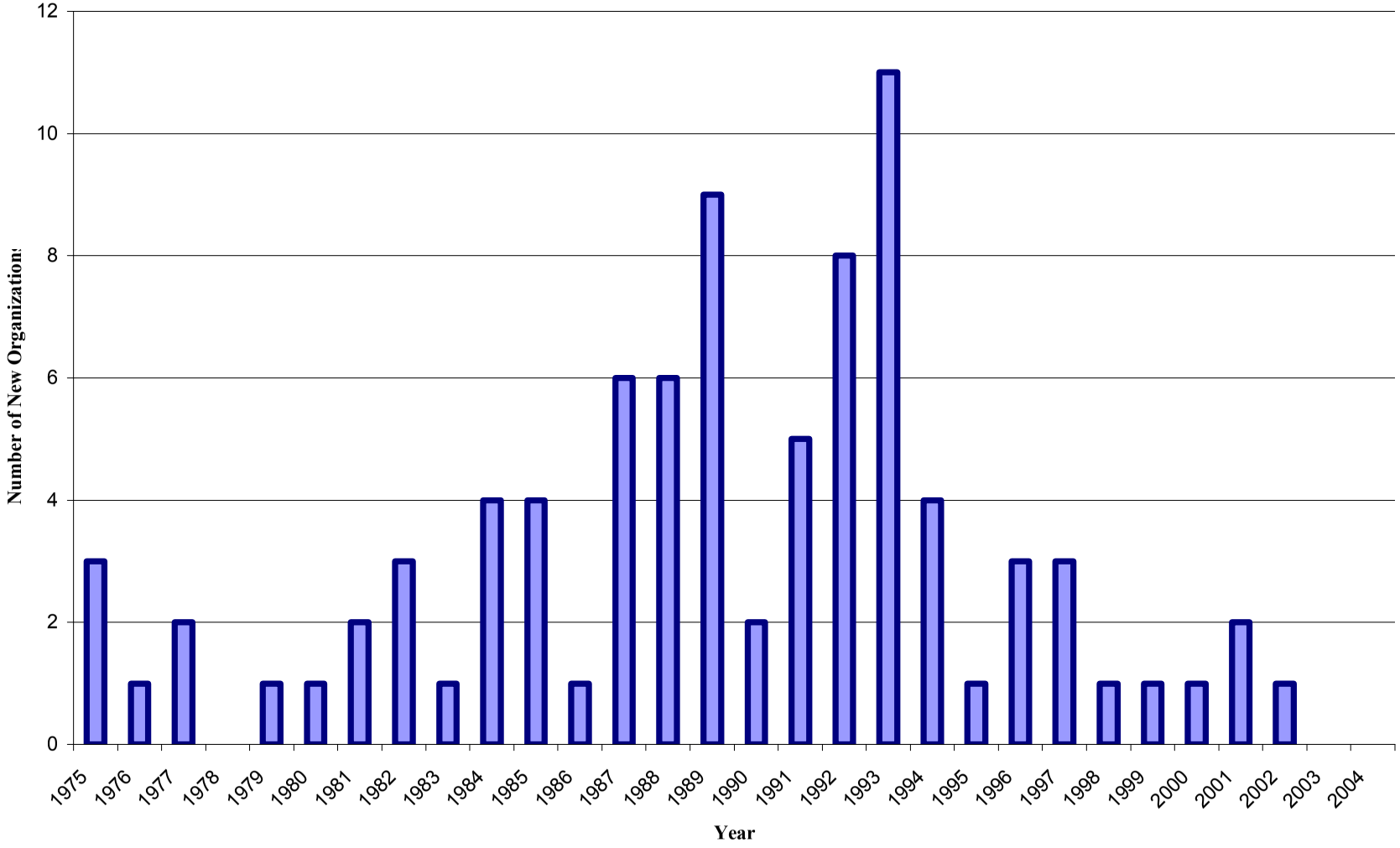

Figure 6. Organizational Crude Birth Rate, 1975-2004

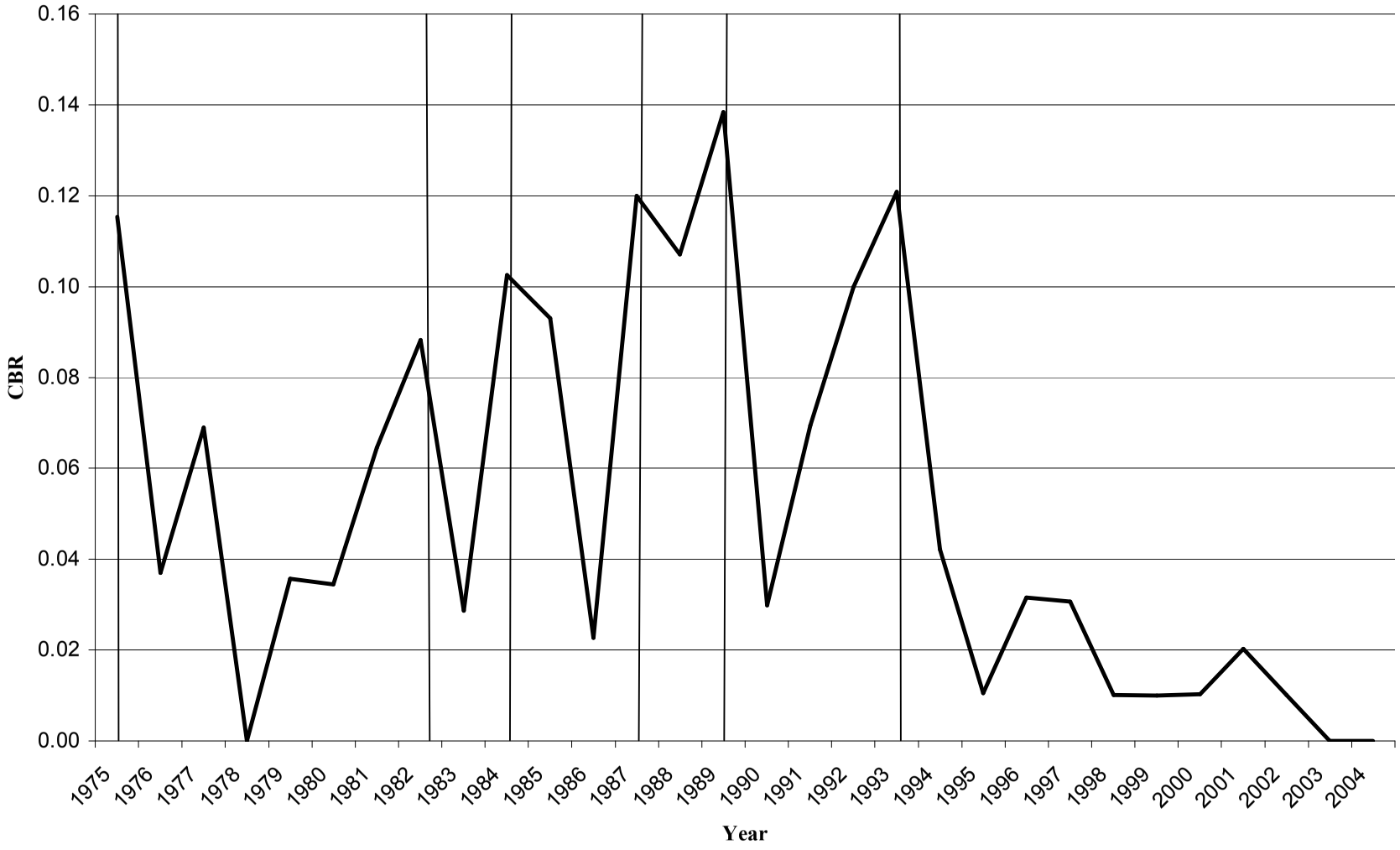

Figure 7. Number of New Population Organizations Per Year, 1975-2004

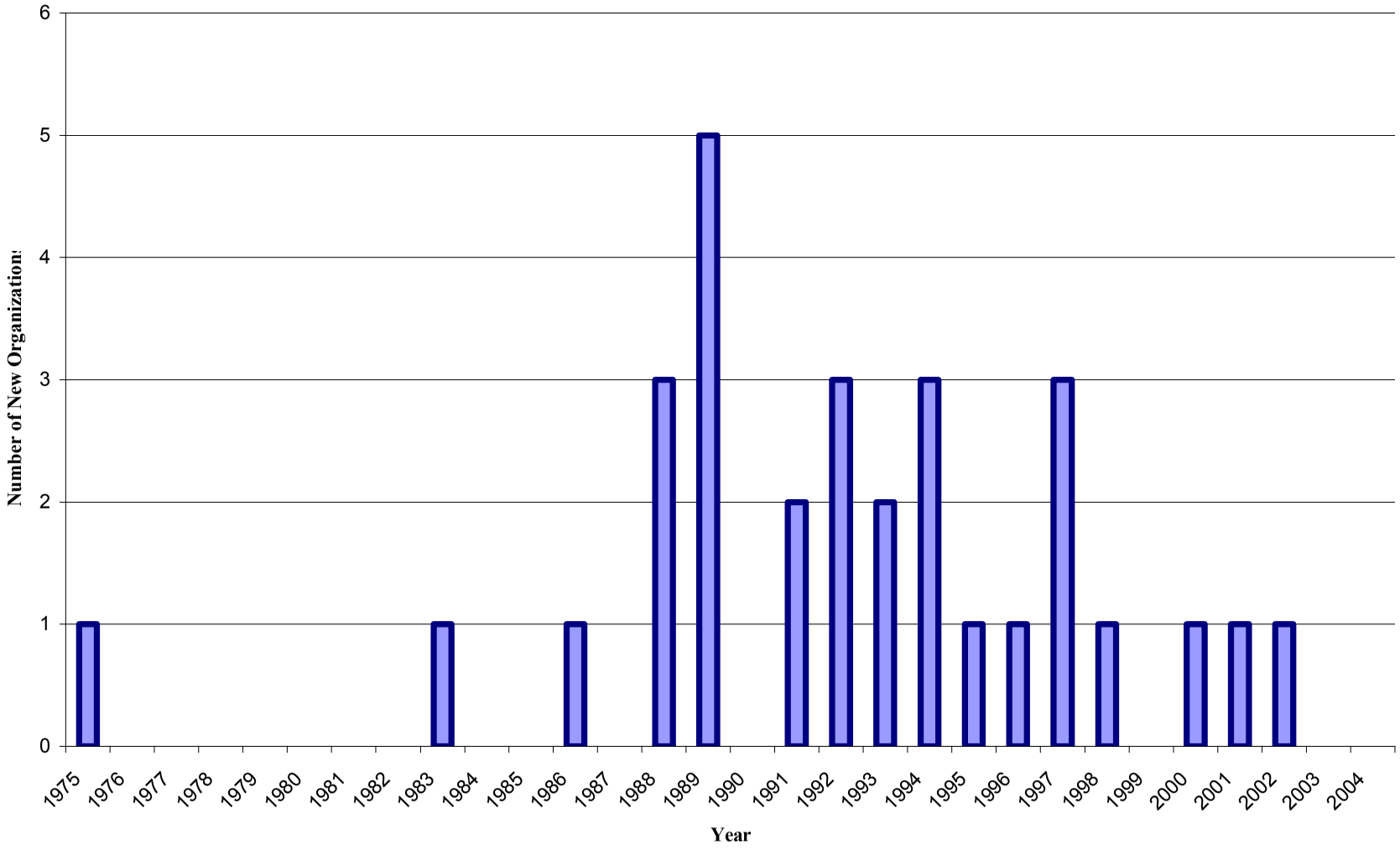

Figure 8. Organizational Crude Birth Rate, Population Organizations, 1975-2004

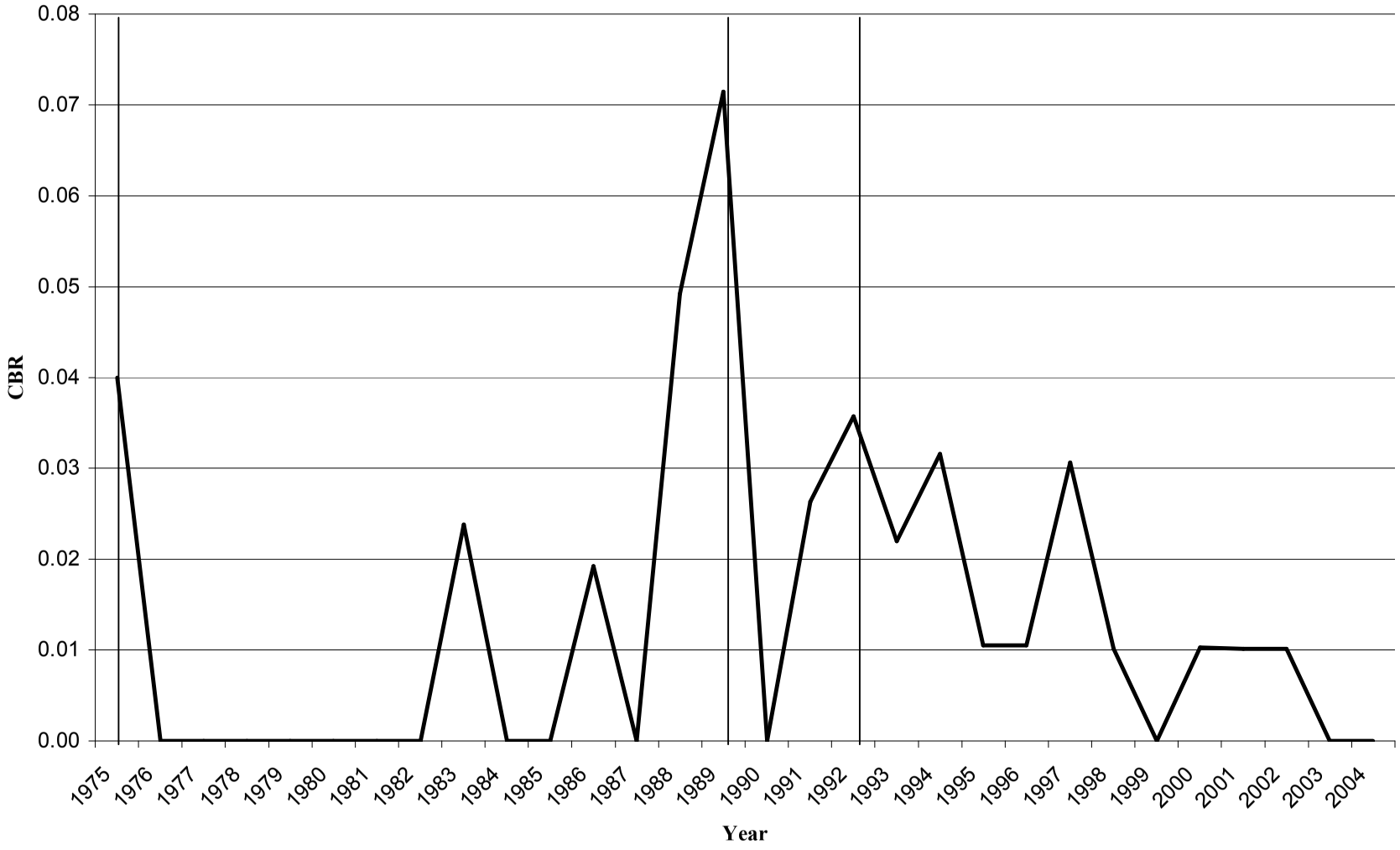

Figure 9. Density of Total Data Set and Population Sub-Set, 1975-2004

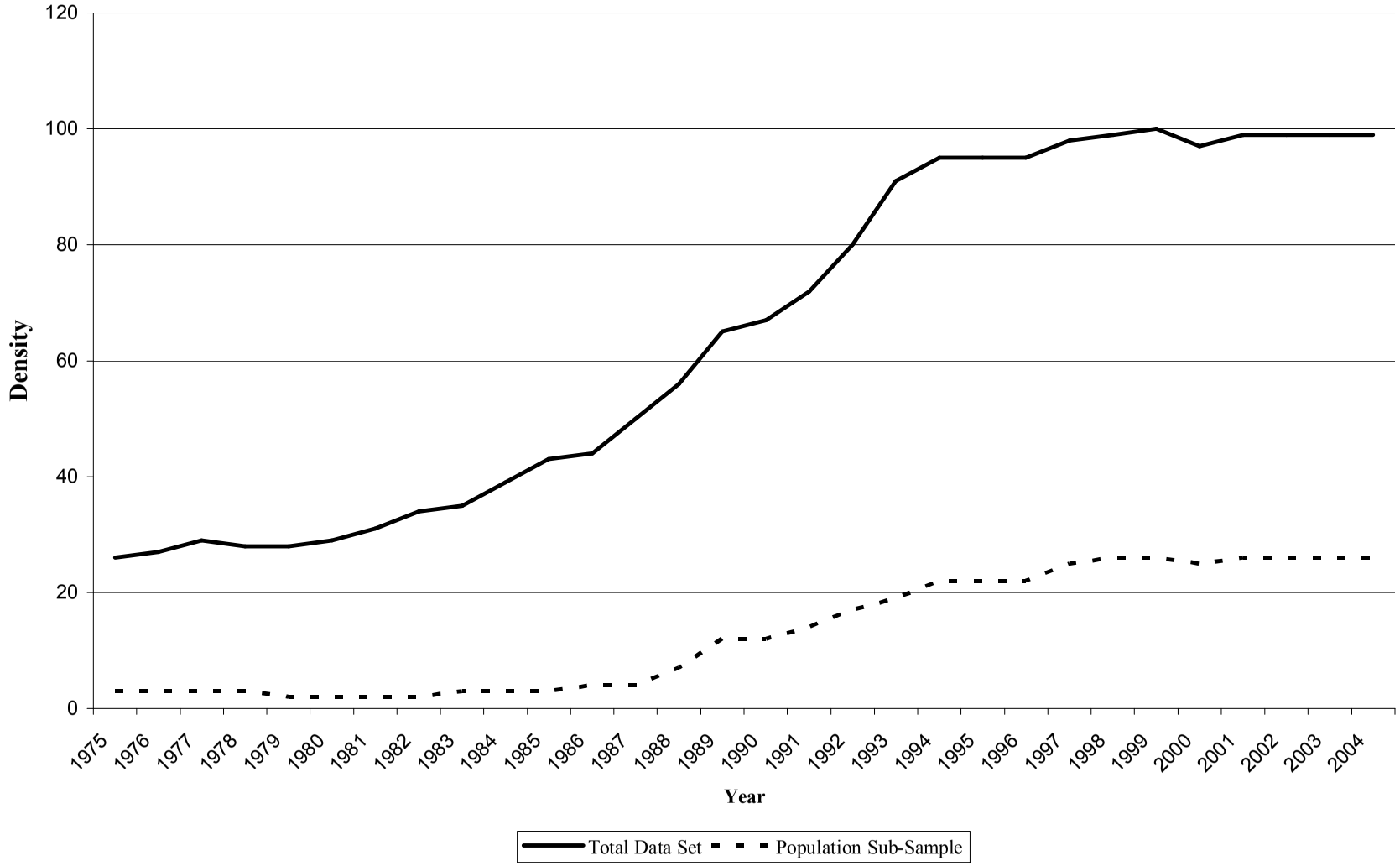

Figure 10. Organizational Density Versus the Organizational Crude Birth Rate