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## DEMOGRAPHIC TRAINING IN AFRICAN INSTITUTIONS

### Past, present and future

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#### **Introduction**

At the turn of this century, there was a heightened discussion on demographic training globally. Most notable and relevant to training of demographers in Africa are the International Union for the Scientific Study of Population (IUSSP) through its working group on training and the Mellon Foundation-funded Population Council project to assess future needs for training and support of population scientists from developing countries. The results of the proceedings of these meeting have several implications for demographic training in Africa. First, demographic inquiry has shifted from the initial focus on describing and explaining population growth and fertility decline in developing countries. The discipline has expanded into areas that demand greater inter-disciplinary focus, such as persistent poverty and inequality, preservation of the environment and the HIV/AIDS pandemic, amongst others. Second, the growing demand for researchers with cross-disciplinary competencies entails that practitioners should be able to understand that there are alternative ways of generating knowledge and appreciate the theoretical basis of different research methods. Third, the changing job market in some countries in Africa demands that training in demography be refocused not only on government needs but also other sectors. The job market has undergone significant changes because government structures are being modified, universities are evolving, non-governmental organizations (NGOs) have increasingly acquired importance in the job market and there is potential for private-sector growth due to the expanding commercial sector and the associated needs. These shifts require demographic inquiry to contribute to clarifying both the population consequences of individual behaviour and the effect of macro-level population processes. Demographers need to have the skills necessary to employ methodologies that can provide explanations of behaviour at multiple levels incorporating individual, household and institutional factors and also changes over time. This implies the need to train demographers capable of fitting into the current and future job market. This chapter provides an overview of the past trends in training needs, focus areas and opportunities and challenges which calls for critical reflection. An important limitation is that it does not in any way prescribe a particular pathway for didactic practices on training in demography in African institutions of higher learning.

## **Historical foundations and initiation of demographic training in Africa (1960–1990)**

Demography as a discipline emerged in the 1920s and 1930s (Vance, 1952 cf. Greenhalgh, 1996; Tabutin, 2007) in the United States and later in France after the Second World War in 1945 (Tabutin, 2007). In Africa, the study of demography emerged in the early 1960s when colonialism ended for most countries and most African countries were beginning to build independent states (United Nations Economic Commission for Africa [UNECA], 1992; UN, 1995; Ntozi, 2011). At the first population conference held at Ibadan University with support from the Population Council in 1966, it was noted that by 1966, at least 15 countries had started teaching courses in demography (Caldwell & Okonjo, 1968), but the training involved introducing course units in established disciplines such as geography, sociology and economics, mostly at undergraduate level.

Post-graduate training in demography in Africa can be said to have been born in the Cairo Demographic Centre (CDC) in Egypt in the year 1963 with support from the United Nations (UN). Thereafter, the United Nations, in particular United Nations Population Fund (UNFPA), was instrumental in the initiation of the teaching of demography in African institutions. The initial institutions were the Regional Institute for Population Studies (RIPS) hosted at the University of Ghana in Accra in 1971 and the Institut de Formation et de Recherche Démographiques (IFORD) in Yaoundé, Cameroon, 1972 (UNECA, 1992). UNFPA was also instrumental in setting up other centres within national universities supporting curriculum development and reviews, staff capacity building and resources to support research (financial and teaching inputs such as computers and software). Apart from the UN system, the Population Council, Rockefeller Foundation and Ford Foundation leveraged their resources to help support infrastructure for population training, including capacity building and research (UNECA, 1992; Klancher, 2017). Bilateral agencies like United States Agency for International Development (USAID) and International Development Research Centre (IDRC) also supported the establishment of many centres (UNECA, 1992). Most of the centres were established in the 1980s (UNECA, 1992), with the most recent being in Southern Africa.

The notable features of post-graduate training programs in Africa are: 1) most of the training programs were established with some external funding, and 2) the departmental locations of the programs varied, implying the structural foundations were not similar. Most programs were initiated in the departments of sociology, economics, statistics or geography. In a few cases, programs were offered in a combined Department of Statistics and Demography, while others, such as the Population Studies and Research Institute of the University of Nairobi, were established as standalones similar to the programs at the RIPS in Ghana, CDC in Egypt and International Institute for Population Sciences (IIPS) in India. Worldwide, demography, as a discipline, is often attached to the faculties of economics, political or social sciences or statistics. Standalone institutions are found in Asia, Latin America and Africa.

## **Training needs and broad curriculum areas**

### *Training needs*

Two early writings describe the general foundations of demographic training needs in Africa. Okonjo (1966) was among the earliest writers on demographic training in Africa. In an article published in the *Journal of Modern African Studies*, the training needs were anchored on the fact that governments of Africa, in planning for economic and social development, became

increasingly aware that they could no longer afford to treat population as an exogenous variable. At that time, the major population issues were the conduct, management and analysis of population census or demographic surveys. The focus was on getting accurate data on population size and structures and on basic demographic dynamics. Hence, studying the component variables of population change, and their interrelationships, became the core of curriculum, with special attention to the role of fertility and mortality. Igun (1976) later, in the earliest journal on population for African professionals, noted that at that time, training for African demographers should emphasize problems in data collection, data manipulation and innovation in solving methodological problems. The training was expected to focus on producing teachers of demography at institutions of higher learning; high-level professionals in governments, especially national statistical offices; middle-level professionals and low-level workers (Igun, 1976). Thus, during the first decade after the initiation of graduate programs, training emphasized the technical aspects of demography in order to meet the needs of the African governments to be able to collect and analyse census and demographic surveys to aid planning for national development.

However, the training needs expanded in the 1980s following the recommendations of the 1984 Second African Population Conference held in Arusha, Tanzania, and the World Population Plan of Action (United Nations [UN], 1979). At the Second African Population Conference, African countries adopted the Kilimanjaro Plan of Action, which called for the need to strike a balance between socio-economic development objectives and demographic objectives in order to improve quality of life for individuals and societal welfare (Van de Walle, Ohadike, & Sala-Diakanda, 1988). The plan of action following the Mexico City declaration on population and development and encouraged countries to establish long-term plans for the regular collection of various demographic and interrelated socio-economic variables, particularly for improvement of the level of living. The plan of action further recommended that training in various aspects of population activities should not be restricted to the higher level of specialization but should also extend to personnel at other levels. These recommendations led UNFPA to initiate long-term financial assistance to establish training and support research in a number of institutions in Africa. The UNFPA project initiation was preceded by a needs assessment prior to formulation and implementation. The needs assessment yielded two important factors that guided the establishment and support for training in several institutions. The first was the need to raise awareness among policy makers about the consideration of population factors. The second was to train personnel who could use population statistics and at the same time confidently talk about the interlinkages between population and other socio-economic factors (UN, 1995). The results of the needs assessment led to the revision of earlier programs and initiation of new programs. The main objective of the training programs was integrating population factors into national development planning. This initiative resulted in some countries initiating demographic programs at undergraduate levels and also at the post-graduate level. The purpose of undergraduate programs was to introduce courses on demography and population studies into professional training of administrators, economists, sociologists and geographers to create awareness and to use and integrate population factors in their future work. The second was to provide a basis for further training in demography for students who wished to specialize. A brief of the historical aspects of demographic training from the 1970s to 1990s was described by the UNECA in the Third African Population Conference held in Dakar, Senegal, 7–10 December 1992 and the UN Report 1995. Later in the mid-1990s, the UNFPA was also instrumental in directly setting up global training programs in three African countries to further create awareness and interest in population and development among policy makers.<sup>1</sup>

### *Broad curriculum areas*

The initial graduate-level program started with postgraduate diplomas (lasting between 9 and 12 months) and master's degree courses (lasting on average 2 years). The curriculum in the early 1970s was largely broad and similar in all institutions. The course content included substantive demography; technical demography; family planning programs; auxiliary subjects including mathematics, statistics, sampling and research methods; and other complementary subjects such as economics, sociology, physiology of reproduction and genetics. This subject matter echoed the needs of African governments as well as citizens for basic demographic information. However, much of the training emphasized demographic data collection and analysis to support statistical agencies and planning departments. Thus, major issues revolved around how to manage population censuses and demographic surveys and to some extent vital statistics.

During this period, a range of techniques were also developed for estimating fertility and mortality for African populations because of the nature of data – incomplete and/or error prone. These methodological approaches formed the foundation of demographic analysis, especially in the use of census data. The seminal book published in 1968 by the Princeton Group, *The Demography of Tropical Africa*, represented a core reference work on fertility and mortality estimation from incomplete data (Brass & Coale, 1968). This period was also marked by the theory of modernization in the social sciences and measurement of the diffusion of western-style urban development and their associated demographic, social, economic and political transitions. The emergent theory highly influenced the nature of social science research and training. Examples of such works included Rostow's (1964) stages of economic growth, Soja's (1968) geography of modernization in Kenya, Mabogunje (1970) hypothesis about migration systems in Nigeria and Amin's (1974) research on modern forms of migration in West Africa. Kpedekpo's (1982) text *Essentials of Demographic Analysis for Africa* introduced students to methods of analysis using typical problems of data in Africa. In summary, the course content of formal demography in the 1970s and 1980s can largely be grouped into a mixture defined by the following categories (Bah (2001): a 'pure' demographic approach (British/North American variant or the French/German variant), statistical approach (including stochastic processes) and indirect approaches to estimation of demographic indicators (as exemplified by United Nations manuals). An example of a typical curriculum for early training programs as described by Bah (2001) is shown in Appendix Table 3.1.

### **Changing scope and diversity in demographic inquiry: 1990 to the present**

In the 1990s, demographers' scope and areas of interest became more diversified (Keilman, 1992), driven by crises and their consequences such as HIV and AIDS, social and political demand (national or international) and funding requirements. Demography as a discipline not only began to venture out of its own territory but opened up to the major issues of society, moving into fields that had once belonged to other disciplines (Palloni, 2002). In Africa, the United Nations International Conference on Population and Development (ICPD), held at Cairo in 1994, and its subsequent plan of action shifted population policy focus by emphasizing human welfare rather than the population stabilization objectives of the previous decade. This shift in policy focus contributed to the diversification of demography to expand beyond its traditional core concerns.

These shifts brought in new themes in demography such as gender dimensions, reproductive health, population and environment and population and development, among others (Caselli,

2002; Tabutin, 2007). The emergence of new themes shifted the research agenda as well as the training needs amidst dwindling financial resources. Menken, Blanc, and Lloyd (2002) indicated that two of the largest donors in the population field (USAID and UNFPA) ceased funding long-term training in the second half of the 1990s. In addition, some centres suffered when support in the form of visiting instructors, teaching materials and training of their instructors was stopped. A review undertaken by Committee for International Cooperation in National Research in Demography (CICRED), covering centres in both English-speaking and French-speaking Africa with respect to their activities, resources, interests and modes of operation, noted a number of challenges (Goldstein, 1994). These challenges included limited funding, problems with structural autonomy within the government or institution, inadequate evaluation of research and too many poor and superficial research products. The inadequate staff often led to low levels of exploitation of data collected in field surveys or available in censuses and other government statistics, while lack of demographic expertise was due to lack of exposure to and use of newly emerging technology (UNECA, 1992; Goldstein, 1994; UN, 1995). In addition, as survey data, including prospects for longitudinal data, especially from demographic surveillance sites, became increasingly available, new insights in analysis techniques were introduced in training modules which were once not available to demographers in the 1970s and 1980s. These expanded the demographic knowledge base to include not only descriptions from estimates but also explanations of the results of the estimation.

The diversification raised debates on and criticisms of the didactic enterprise in demography in terms of course structure, textbook content and teaching style. Many institutions expanded the content and training curricula based on the extended diversity to accommodate new thinking (examples of master's degree curricula post-1994 are given in Appendix Table 3.2 for select institutions in West, East and Southern Africa; see also Wajnman, Rio Neto, & Eduardo, 2003 for Latin America). Some critics did not approve of these new directions (see Margolis, 1997), claiming that the demographic training was veering off the mark. This led to some diversity in the nature of training in several major demographic institutions (Bah, 2001). For example, RIPS revised the academic curriculum from mostly technical demography to a broader and more interdisciplinary program with a representation of quantitative and qualitative perspectives (Madise, 2015).

Worldwide, demography as a discipline has developed, both in terms of its themes and instruments of research and in its teaching, following different pathways and advancing at different speeds (Tabutin, 2007). In the last two and half decades, the science of demography has considerably changed – improving on its original expertise anchored on data collection and measurement to the development of new methodological approaches and diversifying its research topics (Tabutin, 2007). Demography as a science had been highly criticized to be good at measuring but poor or unreliable at explaining (Greenhalgh, 1996). This debate about explanatory or causal research in demography is not new but recurrent (Palloni, 2002; Tabutin, 2007; Burch, 2018). Some observers see demography as being restricted to the analytical, which was originally its strength but is now a serious handicap, while others argue that 'demography does not, in general, deserve to be qualified as theoretically weak' (Poirier & Piché, 1999, p. 42 cf. Tabutin, 2007). The attempts to widen the scope of the discipline have also led to the fragmentation of the discipline (Tabutin, 2007; Courgeau & Franck, 2007).

### **Doctoral training in demography**

Between 1960 and 1990, doctoral training was mainly done outside the African countries, especially in the United States, France, Netherlands, Britain and Australia. A few students

who enrolled in African institutions in doctoral programs sometimes took sandwich courses in developed countries because of limited research infrastructure such as computing and library facilities, amongst other needs. Doctoral training has been offered by thesis only.

Most doctoral-level programs in Africa (South Africa may be an exception) have been described as weak, and the weakest point is the long duration to complete the program (Obamba, 2017). The doctoral student's average desired duration of completion ranges from 36 to 48 months, but the actual period of time may extend by up to 18 months or more (Obamba, 2017). There are several factors behind the long durations to completion, but many are context dependent, such as structure of institutions, funding for training and research and nature of previous student training both at the undergraduate and master's levels (Obamba, 2017).

In general, problems of doctoral training in Africa are not confined to demography only. Africa has a low higher education participation rate (Obamba, 2017). Universities in Africa have a relatively smaller pool of students who can potentially proceed on to PhD programs compared to universities in other continents. The narrow pool syndrome is compounded by the pipeline effect, whereby master's enrolments are growing exponentially, whereas PhD enrolments remain significantly low and stagnant or decline altogether (Obamba, 2017). A study conducted in eight African universities reported that the total master's enrolments in the eight universities more than doubled from 9,625 in 2001 to 25,652 students in 2011 (cf. Obamba, 2017). During the same period, PhD enrolments grew from 1,165 in 2001 to only 2,584 students in 2011 (Bunting, Cloete, & Van Schalkwyk, 2014, cf. Obamba, 2017). The point to note is that there has been no comprehensive review of the discipline of demography covering many parts of the continent ever since the CICRED study in the early 1990s.

According to a recent scoping review (Obamba, 2017) of doctoral studies and research in Africa, there are reports that many institutions of higher learning are preoccupied with a singular focus on the quantity of people holding doctoral degrees. The extent to whether they are enough to replenish the dwindling stock of senior faculty and Africa's aging professoriate (British Academy, 2012; Tettey, 2010) has not been the focus of restructuring higher education training. A large proportion of studies on doctoral programs in Africa has been concerned primarily with quantitative measures, including enrolment numbers, completion rates, numbers of faculty with doctorate degrees, how long it takes to complete the doctorate and similar kinds of directly measurable parameters. This narrative is often framed within the broader structural challenge of producing and retaining the next generation of senior academic staff in most African universities (Obamba, 2017). For demography, this may be an enormous challenge in a number of countries; however, at present, the magnitude of the challenge is still anecdotal.

The present challenge for higher doctoral training and research in demography requires greater focus beyond 'bean-counting' sorts of indicators, although a substantial number of Southern African-focused studies have examined issues around doctoral enrolments, graduation patterns and policy of doctoral programs (Cloete, Mouton, & Sheppard, 2015). There are relatively fewer studies that have focused on doctoral studies at universities in other parts of Africa (Obamba, 2017). An International Association of Universities (IAU) study focused on doctoral enrolments and completions in Rwanda, Kenya, Nigeria, Benin, Cameroon and Senegal (Cross and Backhouse, 2014). Bunting et al. (2014) covered eight flagship universities across Kenya (Nairobi), Ghana (University of Ghana), Nigeria (Ilorin), Tanzania (Dar es Salaam), Mozambique (Eduardo Mondlane), Botswana (University of Botswana), Uganda (Makerere University), Mauritius (University of Mauritius) and South Africa (Cape Town). These studies examined general higher-level education but not demography. The future requires a critical examination of the structure of demography doctoral programs concerning such themes as the

logical organization of demographic and related contents; learning resources and pedagogical activities; and sequencing, objectives and scope (Obamba, 2017).

### **Prospects for future training**

In order to discern what the future holds for demographic training, it is important to reflect on what has happened in the past five decades, when the training programs were initiated and expanded. According to a database maintained by CICRED, the period between 1980 and 1990 was the time when demographic training programs expanded in Africa. The number of centres offering graduate training in demography expanded (see Appendix Table 3.3 for list), but the exact number may be unknown because currently no database exists on university-based demographic training centres. The training needs to be expanded from offering courses to enable graduates to plan, manage and analyse large-scale demographic data sets to those that integrate population factors in development planning. Ever since the ICPD 1994, these needs not only include the capacity to integrate population factors in development planning but also the ability to explain complex societal issues (see examples in Appendix Table 3.2). The centres that offer training in demography in Africa currently offer mainly master's-level training, of which three types can be distinguished. First, the 'traditional' type with a strong quantitative orientation and about two-thirds or more of the coursework consisting of courses in population/demography orientation. The second type seeks to train population scientists in conjunction with other disciplines, and about one-quarter of the coursework in these programs consists of population courses. The third type consists of degrees in other disciplines with one or two population courses such as in public health, sociology, economics, geography or statistics. The great majority of professionals who graduate with master's degrees work for government agencies, NGOs, private firms and even international projects.

Ntozi (2011) indicated that post-graduate diploma and master's programs have been successful despite challenges experienced by various institutions. However, some master's programs have an enormous dimension of courses and a rigid sequential scheme between master's and doctoral programs. PhD training programs have been described as weak (Ntozi, 2011; Ezeh et al., 2010; Menken et al., 2002), and as a result, some centres have introduced taught PhD programs in addition to thesis writing. PhD-level training in demography is still largely conducted in developed countries.

A critical factor in training is the labour market. In the recent decade, the academic job market appears to be stagnant in a number of countries in Africa. The NGO and private sectors are providing a growing number of opportunities for experts in population and related studies. This section highlights the opportunities and challenges to re-invigorate training programs to meet future needs in Africa and includes three major interrelated factors: the changing nature of the discipline; complex policy debates including their formulation, implementation and evaluation; and the labour market prospects.

#### *1 The changing nature of the discipline and inputs for training*

Demography has extended its field of investigation from the macro- to the micro-longitudinal and places greater emphasis on gaining new insight by devising or using more complex information systems and using a variety of statistical tools, often borrowed from outside<sup>2</sup> and adapted to its needs. There has been extensive growth in terms of new thematic areas in the discipline such as household and family dynamics, gender issues in development and program evaluation and increased interest in the use of qualitative methods. The individual, for example, is no longer

seen as a simple trajectory made up of distinct demographic events, each analyzed separately, but as a complex life-course comprising various interconnected types of events (demographic, occupational, residential, etc.), a life of stages and periods with variable causalities (Billari, 2001). This has moved inquiry into a multi-factorial approach giving full place to the family; to the social circle and networks; and to social, economic and cultural factors (Tabutin, 2007). But the move into new frontiers is not without its faults. Tabutin (2007), citing earlier works by Poirier and Piché (1999), raised concerns on the various types of compartmentalization, such as between objects of research, levels of analysis, explanatory factors, critical theoretical thinking and demographic production centres (cf. Tabutin, 2007).

Demography is empirical, with demands on precise analysis, which has been revolutionized by the internet, growth in analysis software ranging from spreadsheets to general-purpose statistical software and simulation techniques. In the 1980s and much of the 1990s, these were hardly available to many teachers and students in Africa. The growth in the use of the internet has changed the scale of intellectual exchanges, while rapid change in the availability of data and computing technologies changed both demographic analysis and teaching. The power of desktop and local computing environments increased and created decentralized data processing environments, which are different from what was in Africa in the 1980s. Two factors have driven the change in approaches to quantitative analysis and teaching: the availability of high-quality large datasets such as censuses and labour-force surveys, Demographic and Health Surveys (DHSs) and multi-cluster indicator surveys (MCISs) and the growing power of computer analysis packages and increasing availability and affordability of computers and associated software. Although in many countries in Africa, censuses and other official data collections may be absent, irregular or unreliable (as in cases of countries in conflict), the collection of such data and establishment of open access platforms such as International Public Use Microdata Series have greatly improved access for many teachers and students to aid teaching and learning.

In addition to increased data availability, students and teachers of demography now have access to e-books and digital publication platforms making referencing easier and quicker, especially through use of citation managers such as Zotero. The internet has also increased chances for consultation and discussion, especially on difficult topics; techniques for analysis; and discussion fora. It has also led to quick remote supervisor–student interactions, especially through mail, chat platforms and virtual exchanges through webinars, among others. The internet is also changing learning platforms – from face to face to virtual systems.

The changing nature of the discipline itself is both an opportunity and a challenge. Tabutin (2007) summarized the status of demography in the 21st century as a long river, but a much broader, more tumultuous and many-branched one. The discipline is challenged from within and in competition with the outside world, which some demographers see as under threat, while some see progress. Demography has assets and achievements, but there are also weaknesses and constraints. The history, institutional status and place of demography vary enormously from one part of the world to another and from one country to another (Tabutin, 2007). However, there is a consensus that demography has certainly become a science,<sup>3</sup> with its body of research objects, methods and paradigms, but the general view is that demography is not, or is no longer, simply a technique for computing rates (Tabutin, 2007).

The rapidly changing nature of demography and its increasingly interdisciplinary nature have implications for the type and content of training. This requires adjustments in what is taught, taking into account new technologies in data collection and access and innovations in academic enquiry (Palloni, 2002; Burch, 2018). In the 21st century, students in post-graduate training in demography may be expected to cover enormous volumes of subject matter. But despite the increasingly wide subject, extending the course is not a suitable option but demands the choice

of minimum core courses to be pragmatic. Reflection is needed to examine program structure and degree requirements due to the interdisciplinary character of demography and, for some countries, the absence of undergraduate degree programs in demography/population studies. The peculiar nature of the discipline demands reviews to identify and reflect on several dichotomies which currently exist. First, there is need for clear distinctions between programs in which demography is a field within another discipline and others in which it is the central axis of a program offered to students from different backgrounds. Second is reflecting between programs that emphasize teaching at least core content with light dissertation work and the others that place emphasis on the thesis research. Third is reflecting on the quantitative–qualitative distinction. The fourth dichotomy is about rigidity and flexibility. These dichotomies need reflections on whether students should specialize in areas such as fertility, mortality or migration without knowing about the others or whether there should be homogeneity. This is one of the greatest challenges in developing appropriate curricular as well as teaching approaches.

Three aspects of the discipline need to be strengthened: 1) its identity or specificity, 2) its social and political utility and 3) its public visibility (see also Tabutin, 2007). Graduates of this century may not find the labour market that requires only measurements or public policy; hence, the competencies must satisfy not only government and quasi-government needs but also those of NGOs and the private sector, for example, exploiting new frontiers, such as applications of demography (Swanson, Burch, & Tedrow, 1996) and expansion to spatial demography, may offer opportunities to meet private-sector needs.

## *2 The changing population policy environment*

Policy frameworks since the ICPD at Cairo 1994 and subsequent reviews for many African countries have changed considerably, requiring complex investigations, debates on formulations and evaluations. More importantly, the success and sustainability of development strategies require that countries proactively address, rather than merely react to, population dynamics. This necessitates countries mapping population characteristics and needs and understanding how changes in structure and dynamics affect development. The availability of data and the analytical capacity to forecast population dynamics and assess demographic and development linkages are critical for the design of effective, evidence-based population policies and programs. This new perspective is also reflected in emerging ‘demographic intelligence’.<sup>4</sup> How are the various institutions training demographers in Africa preparing for this opportunity? A response to this question requires that institutions reflect on the rationale for demographic intelligence operations. First, are the changing needs related to challenges of development, including the fact that population issues may be both a cause as well as a consequence of development challenges? Second, skill sets are changing to accommodate a data-driven world. It is increasingly valuable for professionals to be able to use data to make decisions and use visuals to tell stories of when data informs the who, what, when, where and how. There is rapid growth in demand for ‘data scientists’<sup>5</sup> and expansion of data sources for demographic inquiry such as data from private-sector domains. A refocus on data generation processes, including the use of ‘big data’ from the private sector, expanded administrative/routine data and surveillance data, is imperative. For example, studies on migration (whether internal, international or transnational) impact have in recent times focused on the role played by remittances. But remittance transaction data is not only within the domain of government agencies such as national statistical offices or central banks but also with the private sector such as the telecommunication/mobile phone industry. Policy makers also need to understand data better in addition to current demand to determine who is being left behind. Thus, training is needed to produce demographers capable

of developing careers in data science, which requires knowledge in appropriate data visualization, data mining and data analytics, including machine learning processes and reintegration of spatial data in analysis.

### *3 Labour market dynamics*

Prior to the beginning of the 21st century, the largest number of demographers were employed in the government sector. Those with master's-level training or even undergraduate-level training in population or statistics were employed in technical positions such as national statistical agencies, planning ministries, finance and health. Many countries in Africa also established national population councils/secretariats that worked on population policies and occasionally conducted research. Government-sector job opportunities, particularly those with master's-level training, increased in Africa as governments decentralized, and population issues were increasingly recognized as key to development planning. Those with doctoral training were most likely to be found in senior-level positions in these agencies in the government, but the majority joined teaching (especially at universities), which has expanded in many countries.

After the ICPD held at Cairo, a large number of NGOs working in the areas of reproductive health and HIV/AIDS were established. The increase in the NGO sector can be attributed to the reluctance of governments to tackle controversial issues and, more recently, to the decline in government-sector employment opportunities. Population specialists were sought by NGOs to provide technical expertise in project monitoring and evaluation. As the requirements of some donors for 'results-based management' of projects has grown over the last several years, so has the demand for such expertise. Job opportunities in the NGO sector therefore require additional skills beyond training in demographic estimations.

Many African countries provide few employment opportunities for population specialists in the private sector, especially expanding actuary markets, market surveys and analysis, amongst others. The types of skills population experts can bring to private industry include analysis of the impact of demographic changes on the business environment and business decision-making using techniques of projection and forecasting. Healthcare organizations and market research organizations are also potential employers of population experts. These changes provide opportunities for employment of those with advanced demographic skills (examples include private industry in Mexico and India).

Related to the labour market is that students who were registered for the graduate level were often supported from scholarships by national governments, bilateral agencies, UN systems or philanthropic organizations. In a number of countries, this support for training has dwindled. With the severe reduction in funding, students have resorted to paying fees on their own. This has been one of the major challenges facing a number of institutions, and these institutions need to turn to resources generated within Africa and in particular the private sector; hence, training and research need to include meeting the needs of this sector.

## **Conclusion**

The opportunities and challenges arising from the changing nature of the discipline, labour demands and government needs have training implications. The challenges in conducting an interdisciplinary course in demography should be considered in terms of the principal dimensions of a teaching program, namely teachers, students, level of teaching and institutional or organizational framework (such as course structure and content, resources that facilitate teaching-learning interactions and quality assurance schemes). Similarly, efforts should be made to

establish and nurture close collaboration with the industry both in the public and private sectors for purposes of increasing and sustaining enrolment, research funding and utilization of demographic data and research information. Burch (2018), in reflections on the principles of teaching demography, mentions the major ones that can be used to shift from a rather ‘abstract’ demography to a more practical and probably more attractive demography. These include 1) integration of ‘techniques’ and ‘explanatory factors’ rather than teaching them in separate courses; 2) giving more weight to theories and conceptual frameworks; 3) paying greater attention to practical illustrations of the history of change in the world; and 4) developing computer tools needed for application exercises, simulation and error testing in data collection and methods. The expansion of internet technology and more recent experience with COVID-19 pandemic consequences also need review, especially mode of learning and associated infrastructure requirements.

*Appendix Table 3.1* An Example of Training Curricula 1980–1984 at the Population Studies and Research Institute, University of Nairobi, Kenya

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<b>Year 1</b>
<b>Term 1</b>
Introduction to Demographic Techniques
Basic Mathematics for Population Studies
Applied Probability and Stochastics Processes
<b>Term 2</b>
World Population Trends and Population Situation in Africa
Social Statistics for Population Analysis
Fertility and Development
Advanced Demographic Techniques
Population Mathematics
<b>Term 3</b>
Theories of Population and Socioeconomic Development
Urbanization and Human Settlements
Population Estimates and Projections
Stable Population Theory
<b>Year 2</b>
Thesis

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*Appendix Table 3.2* A Summary of Selected Demographic Training Centres in Africa Curricula

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<i>Name of the Centre/ Institution</i>	<i>Details of the Centre/Institution</i>
Cairo Demographic Centre	The Cairo Demographic Centre was established in 1963 according to an agreement between the Egyptian government and the United Nations. In 1992, the CDC was declared an independent institution, marking the end of the three decades of UN support. Starting that year, the CDC operated under the auspices of the Egyptian government. The CDC provides training at various academic levels to persons working in the field of population in the countries of the Middle East, Africa and Asia. The CDC executes and conducts training programs and awards students with a general diploma in demography, special diploma in population and development, master of philosophy (MPhil) in demography and

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*(Continued)*

Appendix Table 3.2 (Continued)

Name of the Centre/ Institution	Details of the Centre/Institution
Regional Institute of Population Studies, University of Ghana	<p>post-graduate diploma in population and sustainable development in collaboration with the United Nations Population Fund. The CDC organizes intensive programs, symposia and workshops on demography, statistics, computer research monographs, working papers, occasional papers and population and development series. UN translated series, and newsletters are regularly published by the CDC. The CDC cooperates and exchanges expertise with regional and international organizations, universities and institutes. The United Nations Population Fund in New York approved giving full accreditation to the CDC as an executing agency. The CDC has one of the richest demographic libraries in the Middle East. The library uses the POPLINE Program obtained from Johns Hopkins University.</p>
	<p>The RIPS was established in 1972 by the United Nations in partnership with the government of Ghana as a regional centre of excellence for teaching and research on population and related disciplines, including health and environment and their implications for development. The RIPS is an important institution in Anglophone Africa for the training of population scientists and generation of high-quality research in population and related disciplines in order to provide solutions for solving development challenges in Ghana and beyond. The RIPS currently offers the following programs: MA, MPhil and PhD in population studies.</p>
	<p><b>Master of arts (MA), population studies</b></p>
	<p>Code            Course title</p>
	<p><b>First semester core courses</b></p>
	POPS 601    Sources, Evaluation, and Adjustment of Demographic Data
	POPS 603    Population and Development Theories and Policies
	POPS 605    Basic Population Analysis
	POPS 607    Introduction to Statistical and Computing Techniques
	POPS 609    Methods of Social Research
	POPS 610    Seminar
	POPS 600    Dissertation (both semesters)
	<p><b>Prescribed electives</b></p>
	POPS 611    Qualitative Research Methodology
	POPS 613    Population and Family Health
	POPS 615    Population, Ageing and Development
	POPS 617    Population, Human Resources and Development
	POPS 619    Population, Environment and Development
	POPS 621    Population, Health and Development
	POPS 623    Population Change, Agriculture and Food Security
	POPS 625    Population, Urbanization and Development
	<p><b>Second semester core courses</b></p>
	POPS 602    Population Variables and Development Planning
	POPS 604    Social Demography
	POPS 606    Advanced Population Analysis
	POPS 608    Advanced Quantitative Analysis
	POPS 612    Population Estimation and Projection

(Continued)

*Demographic training in Africa*

*Appendix Table 3.2 (Continued)*

<i>Name of the Centre/ Institution</i>	<i>Details of the Centre/Institution</i>
Population Studies and Research Institute (PSRI), University of Nairobi	<p><b>Prescribed electives</b></p> <p>POPS 614 Gender and Reproductive Health</p> <p>POPS 616 Population, Housing, and Development</p> <p>POPS 616 Population, Housing, and Development</p> <p>POPS 618 Mathematical Demography</p> <p>POPS 622 Quantitative Research Methodology</p> <p>POPS 624 Population Change, Governance and Development</p> <p>POPS 626 Population, Education and Development</p> <p>POPS 628 Population, Culture and Development</p>
	<p>The Population Studies and Research Institute of the University of Nairobi was established in 1977 by the government of the Republic of Kenya with the support of the Population Council (New York) to train population scientists/demographers at the postgraduate levels. Since its inception, the programs have been revised several times. The course offered are:</p>
	<p><b>MSc in population studies</b></p>
	<p><b>Year 1</b></p>
	<p><b>Semester one course units:</b></p>
	<p>PMC 500: Population Theories</p>
	<p>PMC 501: Demographic Techniques 1</p>
	<p>PMC 503: Population Dynamics 1</p>
	<p>PMC 508: Theory and Methods of Research 1</p>
	<p>PMA 506: Mathematics for Population Studies</p>
	<p><b>Semester two course units:</b></p>
	<p>PMC 502: Demographic Techniques 2</p>
	<p>PMC 504: Population Dynamics 2</p>
	<p>PMC 505: Computer Applications</p>
	<p>PMC 509: Theory and Methods of Research 2</p>
	<p>PMA 516: Applied Statistics</p>
	<p><b>Elective course units</b></p>
	<p>PMA 510: Population Policies &amp; Sustainable Development</p>
	<p>PMA 511: Population &amp; Health</p>
	<p>PMA 512: Family and Household Demography</p>
	<p>PMC 513: Economic Demography</p>
	<p>PMA 514: Labour Force Dynamics</p>
	<p>PMC 515: Monitoring and Evaluation of Population and Health Programs</p>
	<p>PMC 516: Population Aging</p>
	<p>PMC 519: Urbanization and Population Change</p>
	<p>PMC 520: Biodemography</p>
	<p>PMA 523: Gender Issues in Population Studies</p>
<p>PMC 524: Design and Management of Large Surveys and Censuses</p>	
<p>Year 2</p>	
<p>PMC 526: Research Project</p>	
<p><b>MA course units</b></p>	
<p><b>Year 1</b></p>	
<p><b>Semester one course units</b></p>	
<p>PMC 500: Population Theories</p>	

*(Continued)*

Appendix Table 3.2 (Continued)

Name of the Centre/ Institution	Details of the Centre/Institution
	<p>PMC 501: Demographic Techniques 1                      PMC 503: Population Dynamics 1                      PMC 508: Theory and Methods of Research 1                      PMA 506: Mathematics for Population Studies</p> <p><b>Semester two course units:</b>                      PMC 502: Demographic Techniques 2                      PMC 504: Population Dynamics 2                      PMC 505: Computer Applications                      PMC 509: Theory and Methods of Research 2                      PMA 507: Statistics for Population Studies</p> <p><b>Elective course units</b>                      PMA 510: Population Policies &amp; Sustainable Development                      PMA 511: Population &amp; Health                      PMA 512: Family and Household Demography                      PMC 513: Economic Demography                      PMA 514: Labour Force Dynamics                      PMC 515: Monitoring and Evaluation of Population and Health Programs                      PMC 516: Population Aging                      PMC 519: Urbanization and Population Change                      PMC 520: Biodemography                      PMA 523: Gender Issues in Population Studies                      PMC 524: Design and Management of Large Surveys and Censuses</p> <p><b>Year 2</b>                      PMC526: Research Project</p> <p><b>PhD program</b></p> <p><b>Semester one courses</b>                      PMC 700: Theories and Contemporary Issues in Population and Development                      PMC 701: Advanced Demographic and Statistical Analysis</p> <p><b>Semester two courses</b>                      PMC702: Advanced Social Science Research Methods                      PMC 703: Independent Research Seminar</p> <p><b>Elective courses</b>                      PMC 704: Fertility, Family Dynamics and Development                      PMC 705: Health, Mortality and Development                      PMC 706: Migration, Urbanization and Development</p> <p><b>Two- and 3-year</b>                      PMC 800: Thesis</p>
<p><b>Demography and Population Studies Program at Wits University</b></p>	<p>Demography and Population Studies (DPS) Program at the University of the Witwatersrand started in 2003.</p> <p>The Wits Program in Demography and Population Studies offers interdisciplinary graduate teaching and research in demography and population studies. Demography as an academic discipline seeks to explore the dynamics of human populations in relation to the changes in their sizes, structures and distributions. Population changes have implications for the environment, employment, work, family relations, health, ageing and urbanization. The key features are of the programs are:</p>

(Continued)

*Demographic training in Africa*

*Appendix Table 3.2 (Continued)*

<i>Name of the Centre/ Institution</i>	<i>Details of the Centre/Institution</i>
	<ul style="list-style-type: none"> <li>• Interdisciplinary – involving the schools of Public Health and Social Sciences</li> <li>• A focus on public and reproductive health</li> <li>• Global partnerships with Northern and Southern Institutions</li> </ul> <p><b>BA program course units</b></p> <p>The BA honours program consists of five equally weighted units, three of which are compulsory. Honours students are required to complete two other units approved by the Head of School from those offered at the Honours level and which are related to demography and population studies</p> <p>SOSS 4012: Introduction to Population Studies            SOSS 4047: Statistics for Demographic Survey and Analysis            SOSS 4048: Health Demography            SOSS 4015: Basic Demographic Methods            SOSS 4016: Migration &amp; Spatial Demography            SOSS 4049: Demography of Fertility &amp; Reproduction</p> <p><b>MA program course units</b></p> <p>Students are required to complete and pass three course units, which are related to demography and population studies, provided that the unit has not been completed at the undergraduate level. In addition, students must complete a research report on a topical demographic or population health issue. The courses offered are:</p> <p>SOSS 7012: Introduction to Population Studies            SOSS 7070: Advanced Statistics for Demographic Survey and Analysis            SOCL 7071: Health Demography            SOSS 7003: Basic Demographic Methods            SOSS 7023: Advanced Demographic Methods            SOSS 7018: Migration &amp; Spatial Demography            SOSS 7072: Demography of Fertility and Reproduction</p> <p><b>PhD program</b></p> <p>This is done by thesis only.</p>

*Appendix Table 3.3 Population/Demography Centres*

Algeria	Département de Démographie, Université d'Oran
Angola	Centre de Formation et Recherche sur la Population, Université Augustinho Neto
Benin	Centre de Formation et de Recherches en Matière de Population, Université Nationale du Bénin
	Centre de Recherche en Reproduction Humaine et en Démographie, Faculté des Sciences de la Santé, Clinique Universitaire de Gynécologie et d'Obstétrique
Botswana	Department of Demography, University of Botswana
Burkina Faso	Unité d'Enseignement et de Recherche en Démographie, Université de Ouagadougou
Cameroon	Institut de Formation et de Recherche Démographiques, Université de Yaoundé II Unité de Recherche en Population et Développement Durable, Faculté des Lettres et Sciences Humaines, Université de Dschang

*(Continued)*

Appendix Table 3.3 (Continued)

Democratic Republic of the Congo	Centre d'Etudes et de Recherches Scientifiques sur les Relations entre l'Education et la Population Département de Démographie, Faculté des Sciences Economiques, Université de Kinshasa
Ghana	Regional Institute for Population Studies, University of Ghana
Kenya	African Population and Health Research Center, Population Studies and Research Institute, University of Nairobi
Mali	Centre d'Etudes et Recherche sur la Population pour le Développement, Institut du Sahel, Comité permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel
Morocco	Centre d'Etudes et de Recherches Démographiques, Haut Agdal Département de Démographie, Institut National de Statistique et d'Economie Appliquée Program de Formation en Population et Développement Durable, Institut National de Statistique et d'Economie Appliquée
Nigeria	Department of Demography and Social Statistics, Faculty of Social Sciences, Obafemi Awolowo University Population Research Unit, Nigerian Institute of Social and Economic Research Population Research Unit, Nigerian Institute of Social and Economic Research
Senegal	Association pour la Promotion des Activités de Population-Sénégal, African Population Advisory Committee Département de la Statistique et de la Démographie, Ecole Nationale d'Economie Appliquée Laboratoire Population et Santé, Institut de Recherche pour le Développement Union for African Population Studies
Egypt	Cairo Demographic Center, Ministry of Population and Family Welfare Centre for Applied Demography and Human Resources Development, Institute of Statistical Studies and Research, Cairo University Department of Demographic Statistics and Biometrics, Institute of Statistical Studies and Research, Cairo University Population Research Unit, League of Arab States Population Studies and Research Centre, Central Agency for Public Mobilisation and Statistics Social Research Center, American University in Cairo
Sierra Leone	Institute for Population Studies, Fourah Bay College, University of Sierra Leone
South Africa	Demography and Population Studies (DPS), University of the Witwatersrand Department of Statistics and Population Studies, University of Western Cape Population Studies and Demography, North-West University Development Studies & Population Studies, University of Kwa Zulu Natal Centre for Actuarial Research (CARe), Faculty of Commerce, University of Cape Town Centre for Regional and Urban Innovation and Statistical Exploration (CRUISE), Department of Geography and Environmental Studies, Stellenbosch University Centre for Population Studies, Department of Sociology, University of Pretoria
Sudan	Population Studies Centre, Faculty of Economics and Rural Development, University of Gezira
Ethiopia	Demographic Training and Research Centre, Institute of Development Research, Addis Ababa University
Swaziland	Statistics and Demography Department, Demographic Unit, University of Swaziland

(Continued)

Appendix Table 3.3 (Continued)

Togo	Unité d'Enseignement et de Recherche Population et Développement, Faculté des Sciences Economiques et Sciences de Gestion, Université du Bénin Unité de Recherche Démographique,
Tunisia	Office National de la Famille et de la Population, Tunis Research and Evaluation Division, Arab World Regional Office, International Planned Parenthood Federation
Uganda	Department of Population Studies, Institute of Statistics and Applied Economics, Makerere University
Zambia	Demography Training Unit, Department of Social Development Studies, School of Humanities and Social Sciences, University of Zambia
Zimbabwe	Centre for Population Studies, University of Zimbabwe

Source: Menken et al., 2002

Additional information has been added for more recent centres with websites.

## Notes

- 1 According to Ntozi, 2011, regional centres in Dakar (Senegal), Rabat (Morocco) and Gaborone (Botswana) closed shop by the end of the 1990s.
- 2 Tools such as log-linear and multi-level models were used in sociology, psychology and economics before they were adopted by demographers.
- 3 Greenhalgh Susan (1996) notes that the 'major aim of this is to construct demography as a science, that is, to prove that demography possesses all the characteristics of a pure science'.
- 4 Demographic intelligence can be considered 'a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information used to enable more effective strategic, tactical, and operational insights and decision-making'. Under this definition, Demographic intelligence encompasses information management (data integration, data quality, data warehousing, meta-data management, text- and content-analytics). Data preparation and data usage are two separate but closely linked segments of the intelligence architectural stack. This definition used here borrows heavily from business intelligence (BI), which refers to technologies, applications and practices for the collection, integration, analysis and presentation of business information.
- 5 Traditional education typically draws a distinct line between creative storytelling and technical analysis; the modern professional world also values those who can cross between the two. Data visualization sits right in the middle of analysis and visual storytelling, which may be important for the visibility that Tabutin, 2007, calls for.

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