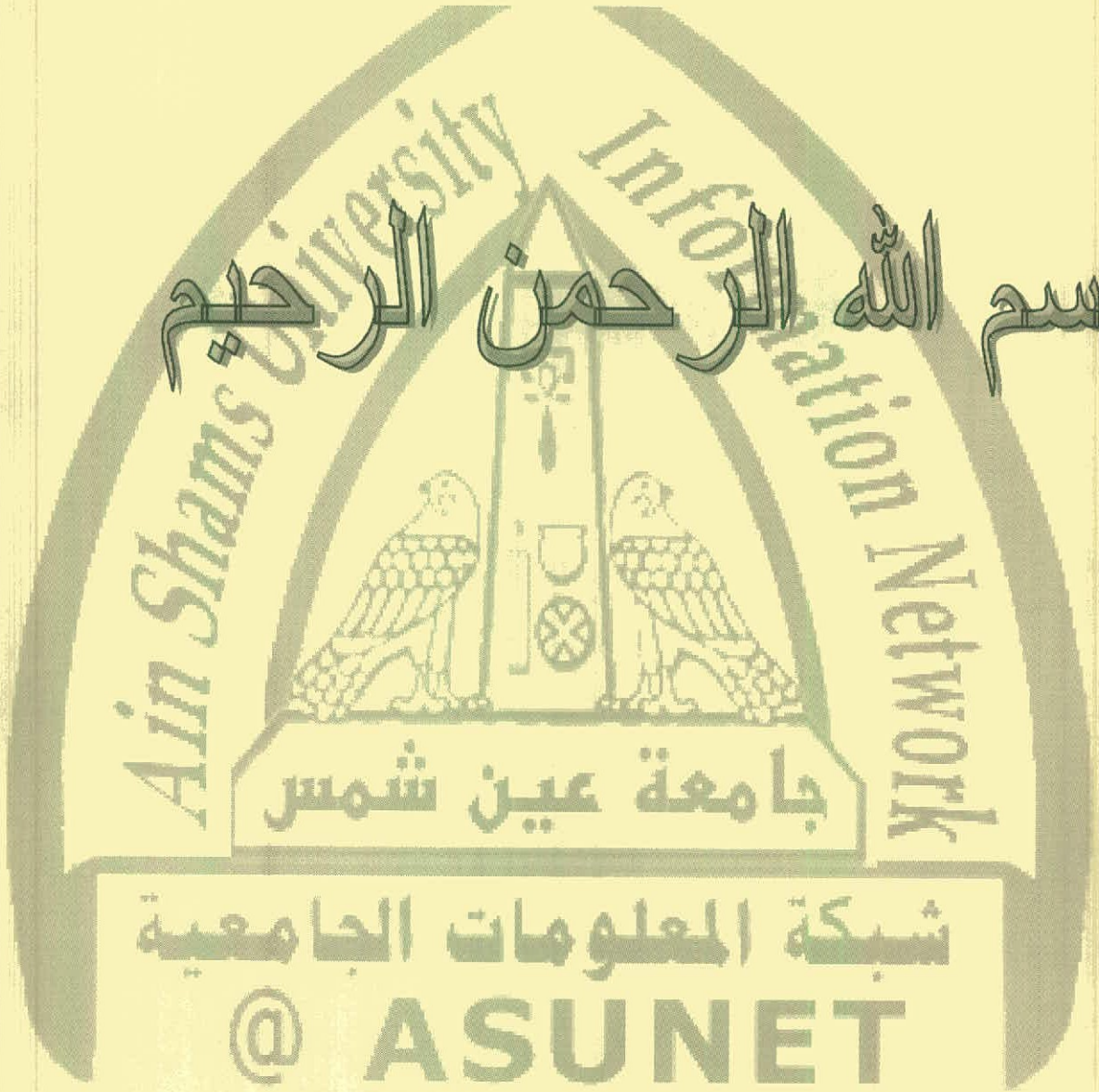
شبكة المعلومات الجامعية



بسم الله الرحمن الرحيم

شبكة المعلومات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد أعدت دون أية تغيرات

يجب أن

تحفظ هذه الأفلام بعيدا عن الغبار

في درجة حرارة من ١٥-٢٥ مئوية ورطوبة نسبية من ٢٠-٤٠%

To be Kept away from Dust in Dry Cool place of 15-25- c and relative humidity 20-40%

بعض الوثائـــــــق الاصليـــــة تالفـــة

بالرسالة صفحات لم ترد بالاصل

Cairo University

Institute of Statistical Studies & Research

Probabilistic Population Forecasts for Egypt

By

Huda Ragaa Mohamed Alkitkat

Under supervision of

Dr. Hesham Makhlouf
Professor of Biostatistics and Demography

Dr. Yousef Mahgub
Professor of Biostatistics and Demography
Vice Dean, ISSR, Cairo university

Dr. Wolfgang Lutz
Professor of Demography and Social Statistics
Programme leader, World Population Programme, IIASA

A Thesis Submitted to the
Department of Biostatistics and Demography
In Partial Fulfilment of the Requirements for the Degree of Ph.D
In Biostatistics and Demography

2009

Cairo University

Institute of Statistical Studies & Research

Approval Sheet

Probabilistic population forecasts for Egypt

By

Huda Ragaa Mohamed Alkitkat

This Thesis for the Ph.D degree in Biostatistics and Demography, department of Biostatistics and Demography, Institute of Statistical Studies and Research, Cairo University has been approved by:

الاسم	التوقيع
أ. د هشام حسن مخلوف	
أ.د محمد نجيب عبد الفتاح	
أ.د يوسف مصطفى محجوب	
أ.د محمد جمعة الروبى	

Date: 23/6/2009

International Institute for
Applied Systems Analysis
Schlossplatz 1
A-2361 Laxenburg, Austria

Tel: +43 2236 807 294
Fax: +43 2236 71 313
E-mail: lutz@iiasa.ac.at
Web: www.iiasa.ac.at

Wolfgang Lutz
Program Leader, World Population Program

March 27, 2009

To Whom It May Concern:

This is to confirm that I approve the probabilistic population forecasts for Egypt prepared by Huda Ragaa Mohamed Alkitkat for her thesis entitled "Probabilistic Population Forecasts for Egypt".

She worked successfully on it under my supervision.

Yours sincerely,

Prof. Dr. Wolfgang Lutz
Leader, World Population Program

Acknowledgment

I would like to express my appreciation to Prof. Dr. Hesham Makhlouf, Prof Dr. Yousef Mahgub and Prof. Dr Wolfgang Lutz for their moral support and continuous encouragement.

I would like to appreciate the staff members of the Institute of Statistical Studies and Research for their support.

I would like to thank and appreciate national and international experts for their valuable comments

TO MY FATHER

List of Acronyms

ASFR	Age Specific Fertility Rate
ASMR	Age Specific Mortality Rate
CAPMAS	Central Agency for Public Mobilisation and Statistics
CDC	Cairo Demographic Center
CBR	Crude Birth Rate
CDR	Crude Death Rate
EDHS	Egypt Demographic and Health Survey
.e0	Life Expectancy at Birth
IIASA	International Institute for Applied Systems Analysis
IMR	Infant Mortality Rate
IUSSP	International Union for Scientific Studies of Population
MDGs	Millennium Development Goals
NRC	National Research Center
RNI	Rate of Natural Increase
TFR	Total Fertility Rate
PRB	The Population Reference Bureau
WB	World Bank
USCB	The United States Census Bureau

Table of Contents

Introduction

Population projections are the basic tools for a wide range of decision makers and planners in many sectors: education, health, manpower, human development and services in any country.

Population projections may be defined as the numerical outcome of a particular set of assumptions regarding the future population.

Projection is a more exclusive term than forecast; as all forecasts are projections but not all projections are forecasts.

A forecast may be defined as "the projection that is selected as the one most likely to provide an accurate prediction of the population so it represents a specific viewpoint regarding the validity of the underlying data and assumptions, accordingly a forecast reflects a judgment, and it can be proven right or wrong by future events" (Siegle et al.,2004).

A population forecast is a projection in which the assumptions are considered to yield a realistic picture of the probable future of the population (Heuveline et al., 2004).

The traditional way to forecast future population is always based on assumptions of three variants (low, medium and high). This approach is incomplete because it ignores uncertainties in mortality, fertility and migration assumptions.

This study will attempt to avoid the problem of uncertainty of the traditional approach by stating probabilities. In other words, it will fully incorporate uncertainties in fertility and mortality.

Study Problem

During the last decades, there were many studies that produced population projections for Egypt using three assumptions or variants (low, medium and high). These projections are deterministic projections which do not give an appropriate indication of the uncertainty.

There are sources of uncertainty inside these projections: for example, accuracy of data, accuracy of parameters estimates and structural change in society specifically the increasingly rapid entry of women into the labour force market.

This approach is also incomplete in the sense that it ignores uncertainties in mortality and migration, even if it provides variants for fertility; it lacks such variants for mortality and migration components.

Study Objectives

The main objective of this study is to provide probabilistic population forecasts for Egypt (2006-2051), depending on incorporation of uncertainties in fertility and mortality components.

This main objective will be fulfilled through some secondary objectives:

1) Review of the available methodologies that deal with uncertainty (for instance: ex-post error analysis, time series, and experts' knowledge).

Input data for most of the available methodologies are:

* Population distributed by age and sex (base year).
* Time series of fertility (TFR as an indicator).
* Time series of mortality (e0 as an indicator)
* Time series of migration (No. of migrants)

2) Selection of a criterion for choosing the right methodology to be utilized in the analysis.

3) Applying the selected methodology to Egypt data

4) Using probabilistic distribution, some indicators will be calculated and studied

This study will be introduced in the following five chapters

Chapter I: Review of literature

Chapter II: Methodology

Chapter III: Egypt Demographic Profile

Chapter IV: Toward Probabilistic Population Forecast for Egypt

***Chapter* V:** Conclusion and Recommendations