

# **Life History of Cardiovascular Disease and Its Risk Factors**

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In memory of Anton Kuijsten.

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Rijks*universiteit* Groningen

# **Life History of Cardiovascular Disease and Its Risk Factors**

**Multistate Life Table Approach and  
Application to the Framingham Heart Study**

Proefschrift

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*To my parents & my small one Mehjabin*



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## Preface

*Life is full of attachments and detachments through matter of choices and opportunities!* After graduation in statistics from the University of Dhaka, I got the opportunity to join as a researcher at International Center for Diarrhoeal Disease Research of Bangladesh (ICDDR,B)- a center for health and population research. During my research at ICDDR,B, I looked for higher studies, got the opportunity to join several places but I made choice to join the Population Research Centre in Groningen. I received my 'doctoraal' (Master's) in Population Studies in 2001. The Master's thesis was the commencement of this dissertation. The subject of this dissertation is fascinating because of its broad research domain, at least from public health perspective. I explore the utility of multistate life table technique in public health research and investigate the cardiovascular disease life history, its risk factors and the compression of morbidity. The general approach is to link demographic and epidemiological methods to develop new public health and life course indicators, which are transparent and policy relevant. A new public health approach to the compression of morbidity debate is initiated that relates risk factor status and disease incidence.

This research- like a journey- has been exciting, dynamic and full of discoveries. There is a great feeling of excitement, as you never know what is coming. This study is a part of the 'Compression of morbidity' project financed by the Netherlands Organization for Scientific Research (NWO). It is a collaborative project between Department of Public Health, Erasmus MC, Rotterdam and the Population Research Centre, University of Groningen. When I started work on this research project, the glossary of compression of morbidity, cardiovascular disease and epidemiology was completely new for me. I was not sure if I had chosen the right track but after two and a half years I have no regrets at all. This is something where I could put my heart into it.

This book would not have been possible without the unflinching support and guidance from Prof. Frans Willekens and Prof. Johan Mackenbach. My earnest thanks and admiration go to both of them. Prof. Frans Willekens taught me multistate method and life history analysis during his course in the Masters program. His enthusiasm, devotion and willingness to share his knowledge have been of essential importance in motivating me to complete this study. During the preparation of this manuscript, I had several tough and stressful times with "deadline, red ink and 'zin' ", however, I fortunately managed with the support and motivation from Prof. Willekens. His use of the Dutch word 'zin' (meaning or sentence) in my drafts has indeed encouraged me to formulate my arguments clearly and coherently to improve my writing skills. Prof. Mackenbach showed me the way to interpret the statistical or analytical results in epidemiologic or public health perspectives. His comments during the NWO meeting and the comments on

the draft version of this thesis made it readable and interpretable for the public health researchers. His sharp interpretation of analytical results has always been awe inspiring and finally made the birth of this book possible.

Prof. Willekens and Mrs. Maria Willekens have supported me in many areas including academic, family, and personal matters. Whatever and whenever I have problems, their door is open to me, their hands are receptive and their heart filled with happiness. My sincere gratitude goes to Mrs. Maria for her care, support and hospitalities at all stages of my stay here.

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I am extremely grateful to the Framingham Heart Study coordinators for access to the Original Data-set, and in particular to dr. Paul Sorlie. The Framingham Heart Study is conducted and supported by the National Heart, Lung, and Blood Institute (NHLBI) in collaboration with Boston University. It should be noted however that the manuscript of this book was not prepared in collaboration with investigators of the Framingham Heart Study and does not necessarily reflect the opinions or views of the Framingham Heart Study, Boston University, or NHLBI.

I express my appreciation to the members of my home organization ICDDR,B, from where I am on official leave now. Especially I would like to thank Professor Mahmud Khan, Dr. Abbas Uddin Bhuyia, Professor Lars Ake Persson and Professor David Sack.

Special mention and gratitude go to Jeroen van Ginneken, who showed me the way to reach PRC in Groningen University. We are always good friends from ICDDR,B. I am grateful to his inspiration and hospitality. My special thanks go to one of my best friends Rian Scheffer, who taught me how to behave and adapt

environmentally in the Dutch culture. She has always been a constant source of encouragement for me.

With my friends at PRC, Sabu Padmadas (now at the University of Southampton) and Salut Muhidin (now at the University of Brown) to whom I am grateful for their very friendly reception on 24<sup>th</sup> of August 1999 that was my entry at PRC. From that time we are always best friends. Thanks go to Inge Hutter, Sergei Scherbov and Harrie van Vianen for their kind suggestions and exchanges of experiences. I had excellent time with my office mate Ganesh and Hideko, with whom I shared both professional and personal events. I also take this opportunity to thank Maaïke, Tomás, Sarbani, Karen, Vladimir, Padma and Alinda who provide active company in PRC. I would also like to thank Jose Dias and Samir (now in Nepal) for the statistical discussions and humor.

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The whole credit goes to my parents! Nothing of my career or my character would have been possible without the great love and care of my parents, which they have always shown to me. Without their blessings, I am nothing. I am grateful to my parents who have taught me honesty, kindness, forgiveness and hard work. My elder brother, Ali Ahmed, has always been a source of strength in all situations and movements of need.

Still I can remember the day I came here, on a sunshine afternoon on 24<sup>th</sup> of August 1999. Just after 4 months my wife Mohsina Khatun (Moury) joined with me at PRC. From that time we have had a wonderful life (that was the first time we started living together). We passed breathtaking life and became parents to a lovely daughter on 26<sup>th</sup> of November 2000. The beginning of our baby was really threatening! She was in hospital for the first 38 days of her life. After a long fight she survived and now she walks, runs, talks .... keeps us busy always with lots of fun and joy. I received much supports from all of my friends, colleagues, relatives and others. All the support from all of you and God's blessings made it possible to overcome all the hard times and begin another joyful life.

My dear Moury, your constant encouragement, support and sacrifice that not only helped me to accomplish this thesis, but also did so with love, humor, and tenacity, was really essential. My love and thanks to my wife, my lovely daughter

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