



A Comprehensive Analysis of the Patterns of Worldwide Mortality Evolution

Martin Genz

Institute for Finance and Actuarial Sciences (ifa), Ulm,
and Institute of Insurance Sciences, Ulm University, Germany

Presented at the Living to 100 Symposium

Orlando, Fla.

January 4–6, 2017

Copyright © 2017 by the Society of Actuaries.

All rights reserved by the Society of Actuaries. Permission is granted to make brief excerpts for a published review. Permission is also granted to make limited numbers of copies of items in this monograph for personal, internal, classroom or other instructional use, on condition that the foregoing copyright notice is used so as to give reasonable notice of the Society's copyright. This consent for free limited copying without prior consent of the Society does not extend to making copies for general distribution, for advertising or promotional purposes, for inclusion in new collective works or for resale.

A Comprehensive Analysis of the Patterns of Worldwide Mortality Evolution

Martin Genz¹

Abstract

A variety of literature deals with the question how the age distribution of deaths develops over time, and many different notions have been established for certain scenarios. In Börger et al. (2016), a classification framework has been developed that allows for a unique classification of mortality evolution patterns. In particular, the framework assigns a unique scenario to any possible mortality evolution. In contrast to many other classification approaches, this approach allows for so-called mixed scenarios, such as a combination of elements of compression and shifting mortality. Thus, it provides a more comprehensive picture of historical and potential future mortality evolution patterns.

In the present paper, we briefly summarize this classification framework and discuss issues in its practical application. Then we apply the framework to mortality data for different countries all over the world. This yields a complete picture of historical mortality evolution patterns in those countries and adds to existing analyses where only certain aspects of mortality evolution patterns have been considered (e.g., a test for one scenario like compression) for only one or a few countries. We then discuss similarities and differences in the historical mortality evolution patterns between different populations. We also apply the framework to different age ranges, since sometimes different scenarios can be observed for different age ranges, even within one population.

¹ Institute for Finance and Actuarial Sciences (ifa), Ulm, and Institute of Insurance Sciences, Ulm University, Lise-Meitner-Straße 14, 89081 Ulm, Germany. phone: +49 731 20 644 264; fax: +49 731 20 644 299; email: m.genz@ifa-ulm.de.